



Calhoun: The NPS Institutional Archive
DSpace Repository

Theses and Dissertations

1. Thesis and Dissertation Collection, all items

12

BITCOIN: A TECHNOLOGY-INFLUENCED SOCIAL MOVEMENT

Johnson, Jason D.; Green, Terrance D.

Monterey, CA; Naval Postgraduate School

<http://hdl.handle.net/10945/63988>

This publication is a work of the U.S. Government as defined in Title 17, United States Code, Section 101. Copyright protection is not available for this work in the United States.

Downloaded from NPS Archive: Calhoun



Calhoun is the Naval Postgraduate School's public access digital repository for research materials and institutional publications created by the NPS community. Calhoun is named for Professor of Mathematics Guy K. Calhoun, NPS's first appointed -- and published -- scholarly author.

Dudley Knox Library / Naval Postgraduate School
411 Dyer Road / 1 University Circle
Monterey, California USA 93943

<http://www.nps.edu/library>



NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

BITCOIN: A TECHNOLOGY-INFLUENCED SOCIAL MOVEMENT

by

Jason D. Johnson and Terrance D. Green

December 2019

Thesis Advisor:
Second Reader:

Ryan Maness
Dorothy E. Denning

Approved for public release. Distribution is unlimited.

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE December 2019	3. REPORT TYPE AND DATES COVERED Master's thesis	
4. TITLE AND SUBTITLE BITCOIN: A TECHNOLOGY-INFLUENCED SOCIAL MOVEMENT			5. FUNDING NUMBERS	
6. AUTHOR(S) Jason D. Johnson and Terrance D. Green				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release. Distribution is unlimited.			12b. DISTRIBUTION CODE A	
13. ABSTRACT (maximum 200 words) Over the past decade, the Bitcoin-inspired cryptocurrency industry and blockchain technology have continued to evolve and reshape the global financial industry, despite resistance from state governments to prevent the adoption of the alternative payment system. The academic study of Bitcoin by various social science disciplines and fields of law has predominantly focused on the nefarious use of cryptocurrency and the potential threat the technology could pose to national security by lessening U.S. economic influence. This thesis takes a more holistic approach in examining Bitcoin using social movement theory to answer two research questions: How can social movement theory explain the evolution of Bitcoin and blockchain technology in the near term and long term? What interest should U.S. Special Operations Command have in Bitcoin (and other cryptocurrencies) and blockchain technology? Social movement theory helps address these questions by providing a comprehensive method for understanding why the creation and adoption of Bitcoin is a form of protest against the financial industry, in general, and the global financial order. The Bitcoin-led social change occurring suggests that the U.S. Department of Defense should seek opportunities to lead the integration and adoption of the technology to maintain, as well as support, future U.S. policy interests.				
14. SUBJECT TERMS social movement theory, SMT, Bitcoin, cryptocurrency, cryptocurrencies, digital assets, blockchain, smart contracts, privacy, protest, Libra, SOCOM, China, Iran, Russia, DPRK, non-state actors			15. NUMBER OF PAGES 93	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UU	

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release. Distribution is unlimited.

BITCOIN: A TECHNOLOGY-INFLUENCED SOCIAL MOVEMENT

Jason D. Johnson
Major, United States Army
BIT, American Intercontinental University, 2006

Terrance D. Green
Major, United States Army
BS, North Carolina A & T State University, 1998

Submitted in partial fulfillment of the
requirements for the degree of

**MASTER OF SCIENCE IN DEFENSE ANALYSIS
(IRREGULAR WARFARE)**

from the

**NAVAL POSTGRADUATE SCHOOL
December 2019**

Approved by: Ryan Maness
Advisor

Dorothy E. Denning
Second Reader

Kalev I. Sepp
Chair, Department of Defense Analysis

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

Over the past decade, the Bitcoin-inspired cryptocurrency industry and blockchain technology have continued to evolve and reshape the global financial industry, despite resistance from state governments to prevent the adoption of the alternative payment system. The academic study of Bitcoin by various social science disciplines and fields of law has predominantly focused on the nefarious use of cryptocurrency and the potential threat the technology could pose to national security by lessening U.S. economic influence. This thesis takes a more holistic approach in examining Bitcoin using social movement theory to answer two research questions: How can social movement theory explain the evolution of Bitcoin and blockchain technology in the near term and long term? What interest should U.S. Special Operations Command have in Bitcoin (and other cryptocurrencies) and blockchain technology? Social movement theory helps address these questions by providing a comprehensive method for understanding why the creation and adoption of Bitcoin is a form of protest against the financial industry, in general, and the global financial order. The Bitcoin-led social change occurring suggests that the U.S. Department of Defense should seek opportunities to lead the integration and adoption of the technology to maintain, as well as support, future U.S. policy interests.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

I.	INTRODUCTION.....	1
A.	APPROACH.....	2
1.	Research Questions.....	3
2.	Privacy, Cryptography, and Digital Currency History.....	3
B.	SOCIAL MOVEMENT THEORY	7
1.	Political Opportunities.....	8
2.	Mobilizing Structures	9
3.	Framing Processes	10
C.	LITERATURE REVIEW	12
 II.	 BITCOIN’S RISE THROUGH A SOCIAL MOVEMENT LENS	 21
A.	ROOTS OF THE BITCOIN MOVEMENT.....	21
B.	THE BITCOIN MOVEMENT	23
C.	IMPACT OF INNOVATION ON BITCOIN SOCIAL MOVEMENT	28
1.	Blockchain	29
2.	The Libra Cryptocurrency.....	30
3.	The Future of the Bitcoin Cryptocurrency Movement	33
 III.	 SOVEREIGN NATIONS, ADVERSARIAL STATES AND NON- STATE ACTORS.....	 35
A.	SOVEREIGN NATIONS AND THEIR USE OF CRYPTOCURRENCIES	35
B.	ADVERSARIAL NATION STATES AND THEIR USE OF CRYPTOCURRENCIES	37
1.	China	37
2.	Iran	39
3.	Russia	40
4.	Democratic People’s Republic of Korea (DPRK)	41
C.	NON-STATE ACTORS	42
1.	al Qaeda and Affiliates	43
2.	Islamic State of Iraq and Syria (ISIS) and Affiliates.....	44
3.	Hezbollah	45
4.	Hamas.....	45
D.	SYNOPSIS	46

IV.	BITCOIN ON THE BATTLEFIELD	49
A.	PRE-MISSION TRAINING	52
B.	DEPLOYMENT	55
V.	CONCLUSION AND RECOMMENDATION	61
	LIST OF REFERENCES	67
	INITIAL DISTRIBUTION LIST	75

LIST OF FIGURES

Figure 1.	Annual Data Breaches and Exposed Records	14
Figure 2.	Data Breaches in the United States by Industry.....	15
Figure 3.	Social Movement Theory.....	22
Figure 4.	Bitcoin Non-profit Organizations	27

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

Table 1.	Non-state Actors' Cryptocurrency Activities	43
Table 2.	95 th Civil Affairs Brigade Task Organization IRT Geographic Combatant Commands.....	50

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

AFRICOM	United States Africa Command
AQ	al-Qaeda
AQB	al-Qassam Brigades
CA	Civil Affairs
CANCO	Civil Affairs Non-Commissioned Officer
CAO	Civil Affairs Operations
CAT	Civil Affairs Team
CB	Collective Behavior
CENTCOM	United States Central Command
CEO	Chief Executive Officer
CERP	Commanders Emergency Response Program
CMOC	Civil Military Operations Center
CONOP	Concept of Operations
DPRK	Democratic People's Republic of Korea
EUCOM	United States European Command
FDD	Federal Defense of Democracies
FINCEN	Financial Crimes Enforcement Network
FOO	Field Ordering Officer
INDOPACOM	United States Indo-Pacific Command
ISIS	Islamic State of Iraq and Syria
KLE	Key Leader Engagement
MRX	Mission Readiness Exercise
NCO	Non-Commissioned Officer
NGO	Non-Governmental Organization
OFAC	Office of Foreign Asset Control
OPFUND	Operational Fund
OWS	Occupy Wall Street
PA	Pay Agent
PBoC	People's Bank of China
PMT	Pre-Mission Training

QR	Quick Response
RMT	Resource Mobilization Theory
SMO	Social Movement Organizations
SMT	Social Movement Theory
SOUTHCOM	United States Southern Command
SWIFT	Society for Worldwide Interbank Financial Telecommunication
SOCAF	Special Operations Command Africa
SOCCENT	Special Operations Command Central
SOCEUR	Special Operations Command Europe
SOCINDOPAC	Special Operations Command Indo-Pacific
SOCOM	Special Operations Command
SOC SOUTH	Special Operations Command South
SOF	Special Operations Forces
SVMA	Somali Veterinary Medical Association
TL	Team Leader
TM	Team Medic
TS	Team Sergeant
TSOC	Theater Special Operations Command
UNSC	United Nations Security Council
U.S.	United States
USD	United States Dollar
VETRETE	Veterinarian Readiness and Training Exercise

ACKNOWLEDGMENTS

Foremost, we would like to express their sincere gratitude to their advisor, Dr. Ryan Maness, for the continuous support of our thesis study and research, and for his patience, motivation, and knowledge, as well as ensuring we stayed on course. We could not have had a better advisor and mentor for our thesis.

In addition to our advisor, we would like to thank our second reader, Dr. Dorothy Denning, for her immense knowledge on the subject of blockchain technology and for always posing the difficult questions for us to answer during the thesis process.

Our sincere thanks also goes to Dr. Kalev Sepp, COL Michael Richardson, and the rest of the Department of Defense Analysis leadership for allowing us to explore a topic that previously had limited academic research behind it.

Last but not least, we would like to thank our families: Jay's wife, Jill, for being patient on the long nights, and Jay's children for understanding when he was busy working on his thesis. Terrance appreciates his daughters' patience and motivational support in completing this thesis.

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

Technology innovation continues to transform how people communicate, work, and interact within an increasingly globally connected world. The creation of Bitcoin and blockchain technology in 2009 marked the birth of the cryptocurrency industry, which has sought over the past ten years to reshape the global monetary system established after the conclusion of World War II. Despite the existence of over 4,800 cryptocurrencies or Bitcoin alternatives in the cryptocurrency industry, Bitcoin remains the most prominent and written about cryptocurrency by scholars.¹

A significant portion of the academic literature on Bitcoin focuses on the use of cryptocurrency in illegal activities, the disruption posed to the global financial order, profitability, and the viability of cryptocurrency as an alternative to fiat (paper) currency. Among the vast body of works on Bitcoin is a small collection of writings that examine Bitcoin and blockchain technology using sociology of money and social movement theory approaches.² This small group of writings helps explain how Bitcoin was able to gain value and social acceptance as an alternative to government-issued currencies, moving beyond the scholarly focus on Bitcoin's early usage for nefarious purposes. This thesis explores the sociological side of money and social-movement-theory-focused literature to explain the evolution of Bitcoin as a social movement and how a future monetary system that utilizes cryptocurrency, in addition to fiat currency, may impact operations for the Special Operations Command (SOCOM).

¹ "All Cryptocurrencies," CoinMarketCap, accessed January 14, 2019, <https://coinmarketcap.com/all/views/all/>.

² Nigel Dodd, "The Social Life of Bitcoin," *Theory, Culture & Society* 35, no. 3 (May 1, 2018): 35–56, <https://doi.org/10.1177/0263276417746464>; Lana Swartz, "What Was Bitcoin, What Will It Be? The Techno-Economic Imaginaries of a New Money Technology," *Cultural Studies* 32, no. 4 (July 4, 2018): 623–50, <https://doi.org/10.1080/09502386.2017.1416420>; Taylor C. Nelms et al., "Social Payments: Innovation, Trust, Bitcoin, and the Sharing Economy," *Theory, Culture & Society* 35, no. 3 (May 1, 2018): 13–33, <https://doi.org/10.1177/0263276417746466>; Venkata Marella et al., "Bitcoin: A Social Movement under Attack," *Selected Papers of the IRIS*, no. 8 (2017): 147–73.

A. APPROACH

The researchers review relevant literature to understand key terminology and processes related to cryptocurrency, blockchain technology, and the monetary system to aid in the forthcoming analysis. The researchers also examine academic literature on social movement theory (SMT) to understand the conditions that lead to social movements (or revolutions). McAdam, McCarthy, and Zald identify three conditions in SMT that are essential to social movements, *political opportunities*, *mobilizing structures*, and *framing processes*, which are generally accepted by modern scholars of social movements.³ The researchers use a qualitative approach, based on SMT, to analyze and explain the evolution of the Bitcoin social movement over the past decade.

First, the thesis traces the history of digital currency ideas to establish a foundational understanding of attempts to introduce alternative technology-based currencies into the monetary system and the communities which sought more privacy. Second, the thesis examines academic literature in two parts. Part one summarizes the SMT focusing on political opportunities, mobilizing structures, and framing processes to provide an understanding of the genesis and the development of social movements. Part two investigates the social science literature noting where there are linkages to SMT, key ideas on Bitcoin's social acceptance, conflicts between Bitcoin's ideology and the social relations of money, and where there are gaps in the previous works. This analysis sets the basis for analyzing the Bitcoin and blockchain technology social movement.

Finally, the thesis examines Bitcoin as a social movement by analyzing the environment shaped by political opportunities, mobilizing structures, and framing process. The researchers focus on Bitcoin's internal development and evolution over the past decade, building upon social science literature. Then the thesis explores external environmental factors such as cryptocurrency innovations, challenges, and threats that seek to change the Bitcoin social movement or bring it to an end. The researchers seek to

³ Doug McAdam, John D. McCarthy, and Mayer Zald, eds., *Comparative Perspectives on Social Movements: Political Opportunities, Mobilizing Structures, and Cultural Framings*, Cambridge Studies in Comparative Politics (Cambridge [England]; Cambridge University Press, 1996), 2.

identify the plausible conditions which result in a future where cryptocurrency is a part of the financial system.

1. Research Questions

This thesis attempts to answer the following questions: How can SMT explain the evolution of Bitcoin and blockchain technology in the near term and long term? What interest should SOCOM have in Bitcoin (and other cryptocurrencies) and blockchain technology?

2. Privacy, Cryptography, and Digital Currency History

Lana Swartz identifies the late 1960s and mid-1970s as the period when “access to state-of-the-art cryptography” was “democratized,” allowing individuals with less powerful computer systems to use the technology, which had previously been reserved for state usage.⁴ In 1983, computer scientist David Chaum proposed the first concept of blind signatures and digital cash or e-cash protocols.⁵ Chaum’s idea failed to gain acceptance, but was a catalyst for the creation of the Cypherpunks mailing list in 1992. The individuals who comprised the group sought to use cryptography and other “related technologies for social and political change.”⁶ Swartz identifies common ideals for freedom, autonomy, and the use of technology and digital cash to create such a society.⁷ There were differing thoughts on how to accomplish this goal, however, leading to the formation of two subgroups from the initial mailing list—the Cypherpunks and the Crypto Anarchists.⁸

⁴ Swartz, “What Was Bitcoin, What Will It Be?,” 3.

⁵ David Chaum, “Blind Signatures for Untraceable Payments,” in *Advances in Cryptology*, ed. David Chaum, Ronald L. Rivest, and Alan T. Sherman (New York: Springer, 1983), 199–203; Swartz, “What Was Bitcoin, What Will It Be?”; Vitalik Buterin, “A Next-Generation Smart Contract and Decentralized Application Platform,” GitHub, accessed September 20, 2019, <https://github.com/ethereum/wiki/wiki/White-Paper#ethereum>.

⁶ Swartz, “What Was Bitcoin, What Will It Be?,” 3.

⁷ Swartz, 4.

⁸ Swartz, 4.

The Cypherpunks and the Crypto Anarchists failed to fulfill the vision of using cryptography in the creation of freedom through privacy and digital currency, however, academic and commercial advances were made using the technology throughout the 1990s.⁹ Other digital currency ideas over the period included computer scientist Wie Dai proposed a b-money concept that involved “solving computational puzzles and decentralized consensus.”¹⁰ Hal Finney’s 2005 concept of reusable proofs of work which combined “ideas from b-money together with Adam Back’s computationally difficult Hashcash puzzle.”¹¹ These predecessor ideas all failed to gain adoption but are part of the lineage that provided a foundation for the creation of Bitcoin and blockchain technology.¹²

Following closely after the United States financial crisis, the Bitcoin white paper was published to a Cypherpunk-like email listing in October 2008 under the pseudonym Satoshi Nakamoto.¹³ In the introduction, the white paper stressed the “inherent weaknesses in the trust-based model” of internet commerce, which relies on financial institutions serving as third-party intermediaries.¹⁴ In addition to questioning the trust-based system, the white paper identifies grievances towards transactional costs and increasing infringement on privacy as merchants require more information from customers due to fraud, which diminishes trust.¹⁵

Bitcoin, as proposed by Nakamoto, would solve or replace the issue of trust using “cryptographic proof-of-work” to complete peer-to-peer transactions within a decentralized electronic network and unchangeable public history of transactions.¹⁶ Four months after publishing the white paper, the genesis block of Bitcoin was mined,

⁹ Swartz, 3–6.

¹⁰ Buterin, “Next-Generation Smart Contract”; Swartz, “What Was Bitcoin, What Will It Be?,” 6.

¹¹ Buterin, “Next-Generation Smart Contract.”

¹² Buterin.

¹³ Swartz, “What Was Bitcoin, What Will It Be?,” 6.

¹⁴ Satoshi Nakamoto, “Bitcoin: A Peer-to-Peer Electronic Cash System,” www.bitcoin.org, October 2008, 1, <https://bitcoin.org/en/bitcoin-paper>.

¹⁵ Nakamoto, “Bitcoin,” 1.

¹⁶ Nakamoto, 1–9.

marshaling in the cryptocurrency industry or what this research characterizes as the “Bitcoin social movement.”¹⁷ The birth of Bitcoin in 2009, along with its underlying blockchain technology, has spurred innovation in the international and domestic financial system. First, it has promoted the idea of individuals being free or empowered with autonomy to make payments outside of the trusted third-party financial system. Second, the blockchain technology permitted the recording of public, irreversible transactions creating greater transparency than what has occurred with traditional financial institutions acting as an intermediary.

Bitcoin’s white paper by Nakamoto was released in October of 2008 and described a peer-to-peer electronic cash system that used cryptography and an open distributed ledger called a blockchain.¹⁸ Cryptography is the use of advanced mathematical equations or algorithms and secret keys to encrypt and authenticate data.¹⁹ Bitcoin was the first of currently over 4,800 cryptocurrencies to utilize the blockchain.²⁰ Blockchain allows for transactions to be recorded publicly without the use of a traditional financial institution as an intermediary. Nakamoto envisioned a borderless, ungoverned global currency to bypass the current global financial structure that has become cumbersome with transaction fees and intermediaries.

In early 2009, the genesis block of Bitcoin was first mined through a computational process that validates blocks of transactions recorded on the ledger.²¹ Since then, over 17.4 million of Bitcoin’s hard coded limit of 21 million Bitcoin have been mined.²² Once the approximate 21 million Bitcoin are mined, there will no longer

¹⁷ Swartz, “What Was Bitcoin, What Will It Be?,” 6; Dodd, “The Social Life of Bitcoin,” 37–38; Buterin, “Next-Generation Smart Contract.”

¹⁸ Nakamoto, “Bitcoin.”

¹⁹ William J. Buchanan, *Cryptography* (Demark: River Publishers, 2017).

²⁰ CoinMarketCap, “All Cryptocurrencies.”

²¹ “The Bitcoin Genesis Block Newspaper,” Genesis Block Newspaper, January 3, 2009, <https://www.thetimes03jan2009.com/>.

²² “Bitcoin (BTC) Price, Charts, Market Cap, and Other Metrics,” CoinMarketCap, accessed January 14, 2019, <https://coinmarketcap.com/currencies/bitcoin/>.

be block rewards for the miners and Bitcoin stands to be a true deflationary asset.²³ Based on the reduction of miner rewards being cut in half every four years, the last block of Bitcoin is expected to be mined sometime around 2140.²⁴

Blockchain technology, the linchpin technology behind Bitcoin, is a distributed ledger that provides transparency as transactions are recorded to the blockchain. The transparency aspect results from the information being stored on the blockchain, which is viewable by anyone.²⁵ The mining process, which records transactional information to the blockchain, creates an immutable timestamp embedding trust within the system. Each list of information is recorded to the blockchain as a *block*.²⁶ As each block is mined, it is linked to the previous block.²⁷ Bernard Marr highlights in his article that “blockchains are excellent for recording events—like medical records—transactions, identity management, and proving provenance.”²⁸ The majority of newer cryptocurrencies are focused on the secure data verification and storage aspect of the distributed ledger technology or blockchain as its commonly referred to.

Over the last decade, thousands of Bitcoin alternative cryptocurrencies have entered the market along with new methods for employing blockchain technology. Bitcoin is the most well-known and the most written about cryptocurrency by scholars, despite the existence of numerous alternatives. Whether or not there is a future in the monetary system for cryptocurrencies is the subject of debate among scholars and politicians. Some scholars, cryptographers, and financial experts believe that cryptocurrencies will eventually cease to exist while others within the various professions argue for a monetary system based solely on a global cryptocurrency. This research seeks

²³ Rainer Böhme et al., “Bitcoin: Economics, Technology, and Governance,” *Journal of Economic Perspectives* 29, no. 2 (May 2015): 216, <https://doi.org/10.1257/jep.29.2.218>.

²⁴ Pavel Ciaian, Miroslava Rajcaniova, and d’Artis Kancs, “The Economics of BitCoin Price Formation,” *Applied Economics* 48, no. 19 (April 20, 2016): 1801, <https://doi.org/10.1080/00036846.2015.1109038>.

²⁵ Bernard Marr, “A Complete Beginner’s Guide To Blockchain,” *Forbes*, January 24, 2017, <https://www.forbes.com/sites/bernardmarr/2017/01/24/a-complete-beginners-guide-to-blockchain/>.

²⁶ Marr, “Complete Beginner’s Guide To Blockchain.”

²⁷ Marr.

²⁸ Marr.

to analyze Bitcoin using a social science-based approach to determine if there is a middle ground in the debate where both state-issued currency and cryptocurrency are part of the global monetary system. Social movement theory provides a specific lens to analyze and understand Bitcoin and blockchain technology as a form of social movement and the various actors who are attempting to shape or benefit from the movement.

B. SOCIAL MOVEMENT THEORY

Modern social movement studies are a subfield of sociology, “which is multidisciplinary, involving political scientists, economists, social psychologists, and human geographers”; though it was developed in the 1970s, it is rooted in the early twentieth-century subfield of collective behavior (CB).²⁹ Collective behavior’s understanding of social movements was influenced by “non-democratic movements, like fascism,” which led to the assessment of social movements as the “irrational expression of shared grievances, arising from deprivation or the alienating condition of mass society.”³⁰ Over time, sociologists challenged this “general idea” of social movements by collective behavior studies and “laid the foundation for modern social movement studies.”³¹

Social Movement Theory endeavors to explain the conditions “under which grievances, which are plentiful, transform into mass movements aimed at social or political change.”³² In *Comparative Perspectives on Social Movements*, McAdam, McCarthy, and Mayer identify three “broad sets of factors used in analyzing the emergence and development of social movements:” *political opportunities, mobilizing structures, and framing processes*.³³ The authors emphasize that the ability to investigate using all three factors yields a “fuller” understanding of a social movement.³⁴

²⁹ Gemma Edwards, *Social Movements and Protest*, Key Topics in Sociology (Cambridge: Cambridge Univ. Press, 2014), 1–2.

³⁰ Edwards, *Social Movements and Protest*, 1.

³¹ Edwards, 1–2.

³² Heather Selma Gregg, “Three Theories of Religious Activism and Violence: Social Movements, Fundamentalists, and Apocalyptic Warriors,” *Terrorism and Political Violence* 28, no. 2 (March 14, 2016): 338–60, <https://doi.org/10.1080/09546553.2014.918879>.

³³ McAdam, McCarthy, and Zald, *Comparative Perspectives on Social Movements*, 2.

³⁴ McAdam, McCarthy, and Zald, 7.

1. Political Opportunities

Political opportunities (and threats) developed from political process theory, which initially drew from the works of Charles Tilly, Doug McAdam, and Sidney Tarrow.³⁵ European scholars trained in new social movements theory further shaped the understanding of political opportunities (and threats).³⁶ Gregg summarizes political opportunities as “a variable that considers how political constraints and opportunities shape the emergence and success of social movements.”³⁷ Political opportunities assist in understanding the environment around a social movement but require understanding the internal organization in addition to at least one or two of the other SMT conditions to explain the success or failure of a social movement fully.³⁸

For example, the civil rights movement in the U.S., from the 1950s into the late 1960s, faced a complex political environment, which impacted the internal organization of civil rights groups as well as the external environment surrounding the movement. Southern states sought to suppress the civil rights movement through the adoption of policies and tactics aimed at preventing collective action protests by movement participants. The actions by local and state governments to limit access to free space caused civil rights groups to utilize churches and other safe spaces to organize and plan their resistance activities against state enforced segregation.³⁹ The existence or lack of political opportunities are neither sufficient to explain the success of the civil rights movement nor are the political conditions likely to be the same for other social movements. Thus, it is important to analyze the other social movement conditions that contribute to the success or failure of a movement.

³⁵ McAdam, McCarthy, and Zald, *Comparative Perspectives on Social Movements*, 2.

³⁶ McAdam, McCarthy, and Zald, 3.

³⁷ Gregg, “Three Theories of Religious Activism and Violence,” 342.

³⁸ Gregg, 342.

³⁹ David S. Meyer and Nancy Whittier, “Social Movement Spillover,” *Social Problems* 41, no. 2 (1994): 279, <https://doi.org/10.2307/3096934>.

2. Mobilizing Structures

McAdam et al. describe mobilization structures as “those collective vehicles, informal as well as formal, through which people mobilize and engage in collective action.”⁴⁰ Mobilization structures grew from resource mobilization theory (RMT), which seeks to explain social movements based on “*how* resources are successfully mobilized, rather than *why* people are aggrieved.”⁴¹ RMT views grievances as a constant in society and not sufficient to be the primary cause of mobilization, which contradicted the CB functionalist view of society.⁴² Functionalists viewed society as an orderly social system that evolves to meet the needs of the environment, but rapid change created by social problems, which represented dysfunctions or structural strains, could cause enough stress to breakdown the normally smooth-running system.⁴³ RMT inverted the view of social movements conveyed by CB, positing that “participants of protests and social movements were rational,” and their decision to join or not join a social movement was proof rational decision making.⁴⁴

The second aspect of RMT, addressed through debate among sociologists, is the collective action problem. Similar to grievances, a shared interest between rational individuals is also not sufficient to lead to collective action. In his 1965 book, *The Logic of Collective Action*, Economist Mancur Olson Jr. concludes that mobilization around a common objective occurs “only when groups are small, or when they are fortunate enough to have an independent source of selective incentives.”⁴⁵ Edwards provides a detailed analysis of the collective action problem debate and the various facets required to lead people to mobilize in support of social movements or protests. Key areas of debate include the availability of tangible and intangible resources, the ability to

⁴⁰ McAdam, McCarthy, and Zald, *Comparative Perspectives on Social Movements*, 3.

⁴¹ Edwards, *Social Movements and Protest*, 42–43.

⁴² Edwards, 42–43.

⁴³ Edwards, 30–34.

⁴⁴ Edwards, 44–45.

⁴⁵ Mancur Olson, *The Logic of Collective Action: Public Goods and the Theory of Groups*, Harvard Economic Studies; v. 124 (Cambridge, MA: Harvard University Press, 1965).

incentivize or coerce, the organizational structure of the movement—formal and centralized or informal and decentralized, or a combination of both, and the over-emphasis of resources in the mobilization of social movements.⁴⁶ Although the level of influence attributed RMT remains in debate, in general, its focus on how ‘rational’ people come together and make ‘rational’ decisions to mobilize aids in understanding social movements beyond the presence of grievances or the opportunity to organize.

Returning to the previously used example of the American civil rights movement, small group organization at the local and state levels was a central part of sustaining the national movement. Church leaders were integral in the mobilization of participants and other resources required for the civil rights movement. As the civil rights movement grew, the coordination of activities also grew in importance, which ties into the final condition of social movement theory—the framing process.

3. Framing Processes

Erving Goffman introduced the frame concept into sociology. Goffman described frames as “schemata (or system) of interpretation to locate, perceive, identify, and label” events, which serve as a means for people to relate to individual or worldly experiences.⁴⁷ Benford and Snow identify collective action frames as a specific category of frames that “help to render events or occurrences meaningful and thereby function to organize experience and guide action.”⁴⁸ Collective action frames serve to inspire action by providing “a diagnosis of the situation, a prognosis about what should be done about it, and motivation for action.”⁴⁹ Gamson and Meyer view social movements as needing to construct “alternative frames of interpretation through ‘rhetoric of change’ to counter

⁴⁶ Edwards, *Social Movements and Protest*, 44–66.

⁴⁷ Erving Goffman, *Frame Analysis: An Essay on the Organization of Experience* / (Cambridge, Mass: Harvard University Press, 1974), 21; David A. Snow and Robert D. Benford, “Master Frames and Cycles of Protest,” in *Frontiers in Social Movement Theory*, ed. Aldon D. Morris and Carol McClurg Mueller (New Haven, Conn: Yale University Press, 1992), 136–37; Robert D. Benford and David A. Snow, “Framing Processes and Social Movements: An Overview and Assessment,” *Annual Review of Sociology*; *Palo Alto* 26 (2000): 614.

⁴⁸ Benford and Snow, “Framing Processes and Social Movements,” 614.

⁴⁹ Edwards, *Social Movements and Protest*; Benford and Snow, “Framing Processes and Social Movements.”

the effect mass media can have on movement actors by broadcasting ‘rhetoric of reaction.’⁵⁰ Edwards describes these constructed “views of reality” as conveying the message that actors “can change things,” together “we should do it now,” and actors “will be pleased” that they to part in the movement.⁵¹

McAdam et al. describe the framing process as “the shared meanings and definitions that people bring to the situation.”⁵² For mobilization to occur, people must “feel aggrieved about some aspect of their lives and optimistic, that acting collectively, they can re dress the problem.”⁵³ McAdam et al. credit Snow with modifying Goffman’s idea of frames and translating it into the framing process, which shifts the focus to the cognitive aspects of social movements though it remains the least studied of the three conditions.⁵⁴

Framing processes are essential to social movements and aid in establishing the “collective identities during periods of peak mobilization,” which can endure even as protests die down.⁵⁵ The initial framing of Bitcoin included privacy, trust, autonomy, and reduced costs to mobilize participants to join the movement. Over time, the framing of Bitcoin has been linked to one group of participants, criminal, threatening to overshadow the innovative and positive aspects of the technology. Later in the analysis, the researchers delve into the use and development Bitcoin and blockchain technology by criminal, non-state actors and adversarial states.

⁵⁰ William A. Gamson and David S. Meyer, “Framing Political Opportunity,” in *Comparative Perspectives on Social Movements: Political Opportunities, Mobilizing Structures, and Cultural Framings*, ed. Doug McAdam, John D. McCarthy, and Mayer Zald, Cambridge Studies in Comparative Politics (Cambridge; Cambridge University Press, 1996), 284–86.

⁵¹ Edwards, *Social Movements and Protest*, 94.

⁵² McAdam, McCarthy, and Zald, *Comparative Perspectives on Social Movements*, 5.

⁵³ McAdam, McCarthy, and Zald, 5.

⁵⁴ McAdam, McCarthy, and Zald, 5.

⁵⁵ Meyer and Whittier, “Social Movement Spillover,” 281.

C. LITERATURE REVIEW

Marella, Lindman, Rossi, and Tuunainen argue that “Bitcoin is a social movement within the financial industry,” seeking to address how cyber-attacks threaten the social movement, i.e., threaten the viability of the cryptocurrency.⁵⁶ Marella et al. draw from the work of McCarthy and Zald to define what a social movement is and pull from the work of Selander and Jarvenpaa to demonstrate an understanding of Social Movement Organizations (SMO).⁵⁷ These key concepts are introduced but not adequately linked to the authors’ theoretical background, which discusses the framing process before applying to Bitcoin. Marella et al. focus entirely on framing process, and collective action frames to analyze and characterize Bitcoin as being a social movement using the writings of Benford and Snow (1988), Benford and Snow (2000), and Chong and Druckman (2007).⁵⁸

Marella et al. succeed in setting a thin foundation of SMT concepts but leaves a significant gap in the analysis by excluding two critical conditions of SMT, political opportunities, and mobilization structures. The myopic focus on framing theory conveys only how the uses of narratives and common purpose are essential to the formation and success of social movements.⁵⁹ Framing theory or a cognitive approach alone does not provide a holistic analysis of a Bitcoin social movement.

The research does introduce the idea of analyzing Bitcoin through SMT to better understand its inception, growth, and potential long-term viability. The authors’ research raises the issues of trust, transparency, and transaction fees in the greater ecosystem of the Bitcoin social movement through the vulnerability of cryptocurrency exchanges from cyber-attacks. Marella’s data sample includes 24 cyber-attacks spanning from 2011 to 2016. The cyber-attacks against exchanges do not involve the theft of personal

⁵⁶ Venkata Marella et al., “Bitcoin: A Social Movement under Attack,” *Selected Paper of the IRS*, no. 8 (2017): 147–73.”

⁵⁷ Marella et al.

⁵⁸ Marella et al.

⁵⁹ Gregg, “Three Theories of Religious Activism and Violence.”

information, but the theft of Bitcoin currency and the impact on its valuation add another challenge for the movement to address.

Marella's research lacks any comparative analysis of cyber-attacks targeting cryptocurrency exchanges and financial institutions to provide additional insight on the number of attacks occurring in the two industries. Figure 1 displays the annual number of data breaches and exposed records in the U.S. from 2005 to 2018 across all industries. The chart shows, in general, that cyber-attacks have been on the rise before the advent of the Bitcoin cryptocurrency in 2009. The purpose of our research is not to specifically investigate cyber-related attacks or discount the validity of Marella et al.'s argument regarding the threat posed by cyber-attacks on the future utility of cryptocurrency, given it is a developing industry. Instead, our focus is towards providing a general context of the threat posed to privacy of information overall.

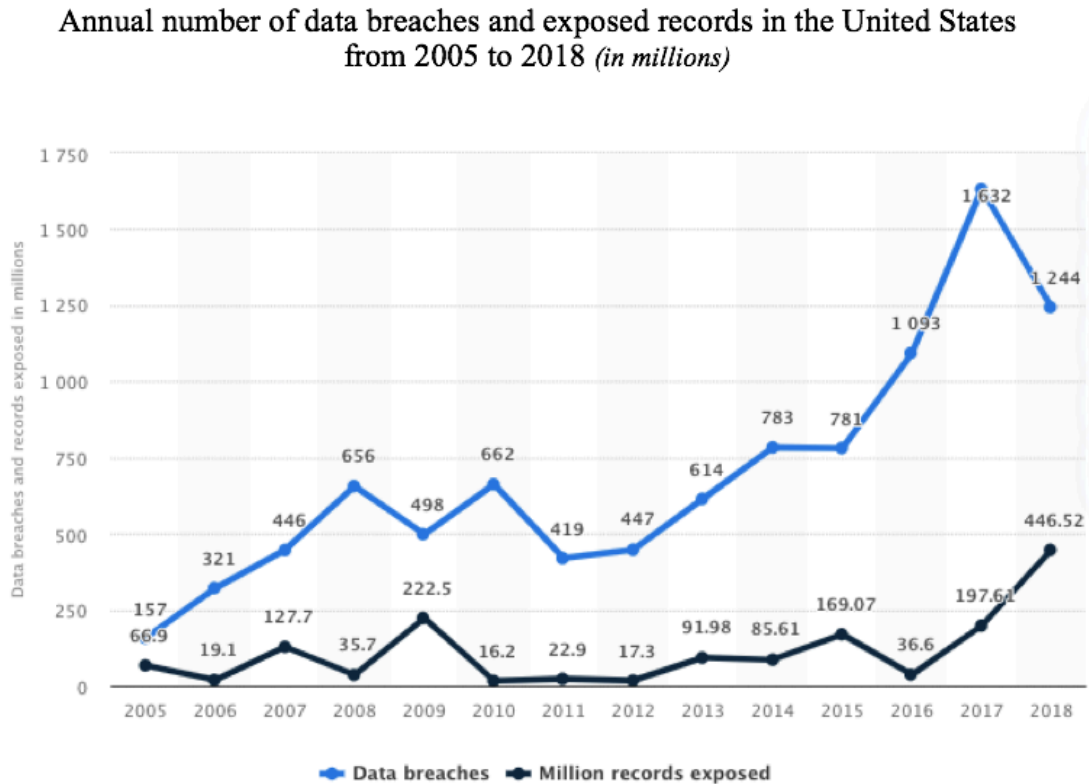


Figure 1. Annual Data Breaches and Exposed Records⁶⁰

In Figure 2, data breaches in the U.S. are broken by industry from 2013 to 2018. Figure 2 further illustrates that cyber-attacks have risen over the six-year period covered. Due to the scope and focus of our research, additional investigation and analysis of the underlying data did not occur. A future project aimed at comparing the impact of cyber-attacks against traditional financial institutions and cryptocurrency exchanges is warranted to improve upon Marella et al.’s research.

⁶⁰ Source: “U.S. Data Breaches and Exposed Records 2018,” Statista, accessed November 5, 2019, <https://www.statista.com/statistics/273550/data-breaches-recorded-in-the-united-states-by-number-of-breaches-and-records-exposed/>.

	Banking/Credit/Financial	Business	Educational	Government/Military	Medical/Healthcare
2013	35	194	54	60	271
2014	38	263	57	91	332
2015	71	312	58	63	275
2016	51	497	97	72	373
2017	134	907	128	79	384
2018	135	572	77	100	367

Figure 2. Data Breaches in the United States by Industry⁶¹

Sociologist Nigel Dodd asserts in his 2018 article “The Social Life of Bitcoin” that Bitcoin is “a social movement as much as it is a currency,” describing the movement as “diffuse and ill-defined.”⁶² Dodd’s primary thesis is concerned with the “paradox” of the Bitcoin phenomenon, which the scholar states as “Bitcoin succeeding as money to the extent that it fails as an ideology.”⁶³ The author describes Bitcoin’s ideology as “the separation of politics—social relations and trust, from money,” which is sustained by the belief of the Bitcoin community that machine code has replaced social relations.⁶⁴ Dodd’s thesis draws on the similarity between gold and Bitcoin, which “mimics the properties” of the precious metal “in virtual form” to assist in understanding part of the complexity of the cryptocurrency.⁶⁵ Bitcoin’s gold-like properties led to early declarations, from within the Bitcoin community, that the cryptocurrency become the new gold standard. However, to return to a gold standard would require countries to institute austerity policies as well as determine a set price for the exchange of Bitcoin, which is counter to its market driven value. Dodd examines three sociological aspects related to Bitcoin: monetary disintermediation, techno-utopia, and social space, before exploring the future of Bitcoin and the blockchain.

⁶¹ Source: “U.S. Data Breaches by Industry 2018,” Statista, accessed November 5, 2019, <https://www.statista.com/statistics/273572/number-of-data-breaches-in-the-united-states-by-business/>.

⁶² Dodd, “The Social Life of Bitcoin,” 40.

⁶³ Dodd, 37.

⁶⁴ Dodd, 37.

⁶⁵ Dodd, 42.

The disintermediation of money investigates the ideology behind Bitcoin and how it seeks the separation of money from both banks and states, allowing it to resonate with “libertarians and anarchists.”⁶⁶ Dodd argues that monetary reform proposing the separation of money from banks or states is not a new occurrence, but Bitcoin’s aspiration to accomplish both is what makes it unique from other movements of the past and present.⁶⁷ The Bitcoin social movement represents a form of ‘protest’ against central-banks and the banking industry, which operate in a monetary system “that it ties the production of money systemically to the production of debt.”⁶⁸ The lack of trust in governments to exercise disciplined monetary policy and concerns over personal privacy and freedom from the “datafication” also support the political argument or framing of Bitcoin as a technological solution.⁶⁹

Dodd’s analysis of Bitcoin’s techno-utopia aspect centers on the aim of the cryptocurrency to be a complete technological solution capable of eliminating human agency and political structures. Despite its reliance on technology, Bitcoin “relies on honoring generalized claims to payment,” like other forms of money, but derives its value from mimicking “the properties of gold in a virtual form.”⁷⁰ Here Dodd draws attention to the theory of money, which distinguishes “credit money” and “species money” and highlights how Bitcoin is framed to appear like the latter. Dodd’s refers to Polanyi’s discussion of laissez-faire capitalism not being “natural” and requiring enforcement through state intervention.⁷¹ The author argues that Bitcoin’s techno-utopia is “embedded within a set of social practices that are sustained by strong beliefs,” leading to his final analysis of Bitcoin as a social space.⁷²

⁶⁶ Dodd, 39–40.

⁶⁷ Dodd, 38–39.

⁶⁸ Dodd, 40.

⁶⁹ Dodd, 40.

⁷⁰ Dodd, 42.

⁷¹ Dodd, 43.

⁷² Dodd, 43.

Dodd's final analysis focuses on removing confusion about Bitcoin's ability to create disintermediation of money from "hierarchical modes of society and social organization."⁷³ The author examines the "sociological thesis that Bitcoin is a horizontal mode of organization."⁷⁴ Dodd disputes the notion that Bitcoin is a "horizontal network that simply embeds trust into computer code," claiming that such an idea "misses some crucial aspects of the reality of Bitcoin's actual operation."⁷⁵ The author's investigation of horizontalism centers on the production or mining of new Bitcoins, which over time, has become centralized due to computer processing power requirements. Dodd's analysis reveals a "socially nuanced and politically loaded network," which is unable to replace social organization solely through the use of technology.⁷⁶

Dodd's writing is useful in unwrapping the evolution of Bitcoin over the past decade without committing to a deterministic demise of cryptocurrency or a definitive future for it. The U.S. financial crisis of 2008 increased calls for social change in the financial system, which aided in spurring interest and early acceptance of Bitcoin's ideology. Bitcoin represents a willingness of people to bestow trust in decentralized technology typically afforded to centralized banks and the state.⁷⁷ Dodd's analysis contains aspects of the framing process, opportunities, and threats in the environment, and the mobilizing structures discussed within SMT and highlight the potential to sustain or derail the Bitcoin social movement.

Nelms, Maurer, Swartz, and Mainwaring's 2018 article "Social Payments: Innovation, Trust, Bitcoin, and the Sharing Economy" focuses on the rapid innovation or "Cambrian explosion" of the payment industry led by "Bitcoin (and its blockchain technology) and the sharing or peer economy."⁷⁸ The authors argue "new payment innovators seek to refunction exchange and repurpose social relations to reimagine

⁷³ Dodd, 43.

⁷⁴ Dodd, 44.

⁷⁵ Dodd, 45.

⁷⁶ Dodd, 46.

⁷⁷ Dodd.

⁷⁸ Nelms et al., "Social Payments," 14–18.

money” through the use of “novel technologies of payment and accounting infrastructures,” eliminating the need for third-party institutions and creating a “just us” economy.⁷⁹ However, using Stearns’ example of BankAmericard, the predecessor of the Visa company, Nelms et al. illustrate that ideas about replacing states as the issuer of money are not new. BankAmericard founder Dee Hock initially imagined the company as “being in the business of the exchange of monetary value and in the business of inventing a digital currency.”⁸⁰

The innovation sought by the payment industry creates a social disruption because trust, typically embedded in the infrastructure of third parties, is redefined through a direct social relationship that no longer requires a governing intermediary.⁸¹ The idea of disintermediation is not new. Nelms et al.’s thought experiment explores the possibility of the social change in the meaning of money spurred by technology innovation in the payment industry, which creates the possibility of closed communities with its form of politics.⁸² The authors assert that these publics, which are seeming free of government and corporate mediation, as still involving “political process, outcomes, and actors” who are “mediated by particular material technologies of communication.”⁸³ Nelms et al.’s essay seeks to look beyond the social framing within the payments industry and dig deeper into the meaning of money, which is shaped by the “kind of public” and “the kind of society” human beings want.

While conducting our research, the authors identified a gap in the literature regarding the evolution of Bitcoin and other cryptocurrencies. Experts have not examined Bitcoin, in-depth, as a social movement. Scholars have given more attention to the impact on the theory of money, disintermediation, regulation, national security, and illegal use of the cryptocurrency. This research will contribute to filling this gap by tracing the

⁷⁹ Nelms et al., 15.

⁸⁰ Nelms et al., 15.

⁸¹ Nelms et al., 20.

⁸² Nelms et al., 26–27.

⁸³ Nelms et al., 28.

evolution of Bitcoin by applying social movement theory to provide a better understanding of it beyond being a disruptive technology.

Social movement theory provides a unique lens to exam Bitcoin and the social change sought within the financial industry. We argue that Bitcoin is a technology based social movement with various actors participating or seeking to benefit from the movement. Nakamoto and the early adopter, libertarians and anarchists, form the initial group of actors responsible for the creation and early sustainment of the Bitcoin movement. Investors, those who have sought to profit from the rise in value of Bitcoin as an alternative to state-issued fiat currencies, have also contributed to the sustainment of the movement helping to legitimize Bitcoin as an alternative store of value. Criminal organizations, like cryptocurrency investors, primarily seek to free-ride on the social movement by taking advantage of the privacy and pseudo-anonymous transaction properties of the cryptocurrencies. As noted in a recent CNA study, criminal organizations (and terrorists) do not seek to invest or hold cryptocurrencies. Instead, these organizations primarily exploit cryptocurrencies to transfer funds, which makes the exchanges between cryptocurrencies and fiat currencies vulnerable to law enforcement efforts.⁸⁴ The final group of actors in the Bitcoin social movement are nation states. States have the ability to influence the internal and external environment of Bitcoin's social movement through legislation and innovation of the technology for state centered purposes. In the chapters that follow, we examine these dynamics through the social movement theory lens to plausibly support or argument that the future financial system will include a form of cryptocurrency and the use of cryptocurrency by Special Operations Forces during future missions.

⁸⁴ Megan McBride and Zack Gold, "Cryptocurrency: Implications for Special Operations Forces" (Arlington, VA: CNA Analysis & Solutions, August 2019), 23–24.

THIS PAGE INTENTIONALLY LEFT BLANK

II. BITCOIN'S RISE THROUGH A SOCIAL MOVEMENT LENS

In this section, the researchers apply social movement theory (SMT) to analyze Bitcoin beyond its use in nefarious activities. The strict focus on the use or potential use of Bitcoin and other cryptocurrencies for illicit activities ignores the growing social resistance that led to the creation of Bitcoin and blockchain technology. Social movement theory provides a comprehensive method for understanding why the creation and adoption of Bitcoin is a form of protest against the financial industry, in general, and the global financial order. Unlike social movements of the past, which used physical protest to seek change, the Bitcoin social movement relies heavily on a protest in cyberspace. Analyzing Bitcoin using SMT also assists in answering the previously stated research questions: What interest should SOCOM have in Bitcoin (and other cryptocurrencies) and blockchain technology? How should SOCOM view cryptocurrencies like Bitcoin in the near term and long term?

A. ROOTS OF THE BITCOIN MOVEMENT

Grievances over individual privacy existed long before the creation of Bitcoin. Similarly, ideas for using cryptographic technology to preserve privacy and transform the financial industry existed before the 2008 U.S. housing and financial market crash. Social movement theory aids in understanding the social conditions in the environment that, combined with advances in technology, enabled a Bitcoin movement to succeed where previous attempts failed. Figure 3 displays Sean Everton's depiction of social movement theory.

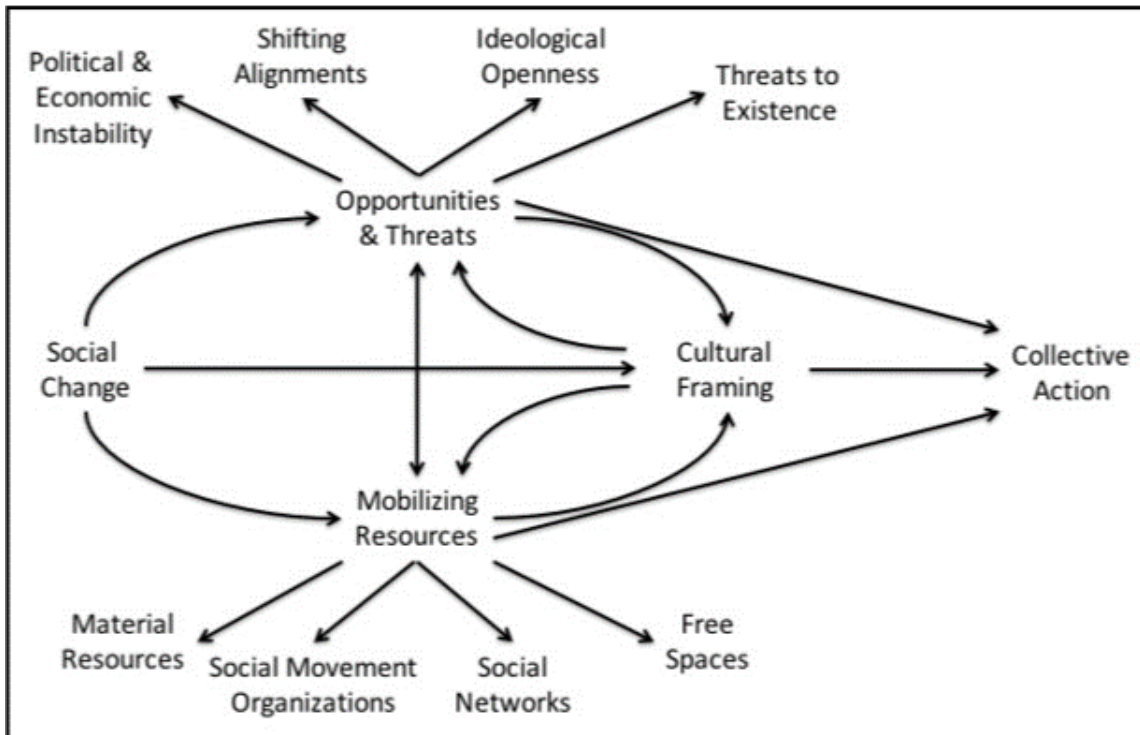


Figure 3. Social Movement Theory⁸⁵

Everton's SMT model captures the three principle conditions—opportunities and threats, mobilizing resources, and cultural framing, initially outlined by McAdam, McCarthy, and Mayer, that contribute to the transformation of grievances into a social movement. The model illustrates the importance of the cultural framing on opportunities and threats and mobilizing resources, which have to be “socially attributed and socially appropriated by people.”⁸⁶ Finally, Everton's model displays the underlying factors within opportunities and threats and mobilizing resources that shape the formation of a social movement.

Opportunities and threats in the environment, alone, do not spark the mobilization of a social movement or revolution just as the ability to mobilize does not guarantee that

⁸⁵ Source: Sean Everton, “Seminar on Theory and Practice of Social Revolution” (class lecture Naval Postgraduate School, Monterey, CA, July 8, 2019).

⁸⁶ Everton, “Seminar on Theory and Practice of Social Revolution.”

a movement will form.⁸⁷ Growing concerns over privacy led to ideas of digital cash instruments like David Chaum's DigiCash, Wei Dai's b-money, and Nick Szabo's bit gold decades before Bitcoin.⁸⁸ Chaum, Dai, and Szabo's concepts were in accord with the grassroots efforts of the Cypherpunks and Crypto-anarchists, who mobilized primarily through online means, in support privacy of information and free markets using cryptographic technology.⁸⁹ These libertarian views aimed at separating money from government control failed because opportunities in the environment, mobilizing structures, and framing processes for digital currency did not draw significant support for the organization of a social movement as well as collective action. Initial digital currency ideas failed to garner wide-spread diffusion. However, the lack of enough acceptance did not bring an end to the research and development of digital currency technology.

B. THE BITCOIN MOVEMENT

Author Gemma Edwards defines social movements as “those collective efforts orientated towards social change that point to circumstances in which creative human action actually shapes and alters social structures, rather than being shaped by them.”⁹⁰ Bitcoin embodies this definition as it is the result of human ingenuity and the use of technology focused on changing the social meaning of money, which includes the creation, storage, and transfer of value electronically. The creation of Bitcoin also represented a resistance movement against the status quo of the current financial system, which at the time was rife with instability.

Most scholars point to the 2007–2008 U.S. financial crisis, which led to global economic instability, as the critical event that caused sufficient political and economic instability in the environment, creating an opportunity for Bitcoin cryptocurrency. Satoshi Nakamoto's Bitcoin White Paper was published in late 2008, following closely after the U.S. financial crisis, to an online email list re-igniting interests in the digital cash or

⁸⁷ Edwards, *Social Movements and Protest*.

⁸⁸ Swartz, “What Was Bitcoin, What Will It Be?”

⁸⁹ Swartz.

⁹⁰ Edwards, *Social Movements and Protest*, 1–2.

cryptocurrency concept.⁹¹ Nakamoto identified trust in third-party financial institutions and the associated transaction costs as primary grievances that Bitcoin cryptocurrency sought to change. In 2009, Bitcoin was launched through a collective effort when the first ‘genesis block’ was mined by Nakamoto.⁹² The Bitcoin launch signaled the start of the cryptocurrency industry or what this paper terms the Bitcoin social movement.

The financial crisis of 2007–2008 created the opportunity for the Bitcoin social movement to emerge with Nakamoto and the cypherpunk like group informally organized and using primarily online means to mobilize resources. The financial crisis also provided the fledgling movement with collective action frames to spark mobilization of the social movement. Bitcoin’s collective action frames included a diagnosis that there was a lack of trust in banks and government. The prognosis was to eliminate the need for third-party intermediaries through cryptographic technology and a decentralized ledger. Finally, the motivation frame included increased privacy, reduction in transaction fees, increased transparency through a distributed blockchain ledger, and a peer-to-peer transactional system, which removes the need for third-party intermediaries.

The creation and launch of Bitcoin and its blockchain technology aided the overall cultural framing of the cryptocurrency in mobilizing initial support from libertarian groups as well as anarchists. These two groups had sought to use cryptography to protect privacy as well as the disintermediation of money from banks and state governments. Bitcoin’s launch in the aftermath of the financial crisis allowed the movement to capitalize on ideological openness in the environment concerning the need for greater transparency and shifting alignment over the transferring and storing of money. Bitcoin’s mimicking of the properties of gold eventually drew the support of investors, which continued the growth of the movement despite a diverging focus on profit. The trading of Bitcoin cryptocurrency aided the social movement because it helped champion the argument that cryptocurrency is a form of stored value or money.

⁹¹ Swartz, “What Was Bitcoin, What Will It Be?”; Dodd, “The Social Life of Bitcoin.”

⁹² Swartz, “What Was Bitcoin, What Will It Be?”

Garnering the interest of investors added another layer of support for Bitcoin, which assisted the social movement to endure, unlike Occupy Wall Street.

Craig Calhoun describes the 2011 Occupy Wall Street (OWS) as a moment rather than a movement because it captured worldwide attention for “an extraordinary six weeks” before dissipating.⁹³ Similar to the Bitcoin movement, OWS was a protest sparked by the 2008 financial crisis. OWS was loosely organized, aimed to change the financial industry, and garnered international support of protests through media attention drawn partially from police responses against protesters.⁹⁴ Calhoun identifies the availability of free spaces for protesters to together gather and the movement’s loose organization as both an advantage and detriment to the OWS movement. OWS was a physical expression of public frustration that relied on the mobilization of people in public spaces. Once dispersed, the loose organization of the movement made it challenging to re-organize and evolve the movement beyond its foundational tactic of public disobedience.⁹⁵ Key differences between the Bitcoin movement, which is a form of protest, and OWS is that Bitcoin does not rely on public spaces or physical protests to mobilize resources. Bitcoin also did not need to change anything – as it created a new alternative to existing financial systems without demanding change in the current systems. It required no government or industry support, in contrast to OWS, which pursued change to the current financial system.

Over the past decade, the Bitcoin social movement has continued to evolve in response to changes in the environment. The foundation of the Bitcoin movement is the technology which once created, can be exploited and used for alternative purposes, which is similar to how social movements and social movement groups can spark or spillover into other movements. The adoption and use of Bitcoin by criminal actors represents one type of permutation of the social movement. The use of Bitcoins on dark websites like Silk Road for money laundering and other nefarious activities began to overshadow the

⁹³ Craig Calhoun, “Occupy Wall Street in Perspective,” *British Journal of Sociology* 64, no. 1 (2013): 26–38.

⁹⁴ Calhoun.

⁹⁵ Calhoun.

initial purpose of the movement. The use of paper currencies, precious minerals, and other accepted forms of value for illicit purposes has existed for centuries. Prior to the creation of Bitcoin, “criminals were exchanging funds digitally – via video games, gift cards, online poker games, etc. – long before cryptocurrency arrived on the scene.”⁹⁶ The U.S. and other state governments have focused on the threat potential of Bitcoin’s autonomy of transactions framing, but ignore the transparency of the distributed and public blockchain ledger, which records every Bitcoin transaction.

The Bitcoin Foundation was established in 2012 to regain control of the narrative for the Bitcoin cryptocurrency. The use of Bitcoin for nefarious enterprises and activities poised a significant threat to the social movement.⁹⁷ The establishment of the Bitcoin foundation marked a transformation within the Bitcoin social movement, creating a formally organized arm or SMO.⁹⁸ That the delineation that the Bitcoin Foundation did not replace the informal portion of the social movement is essential because the informal decentralized nature of the initial movement remains. However, the informally organized arm of the movement was incapable of addressing the rapidly changing environment around the movement, which included increased government scrutiny, control of its narrative, and mobilizing resources to shape and progress the movement.

The Bitcoin Foundation has a formal vision, mission statement, and values that frame the collective identity and shared understanding for its community, but the foundation does not control or manage the Bitcoin currency.⁹⁹ The Bitcoin website list 14 non-U.S., non-profit organizations as part of its community, which enable it to lobby local lawmakers, educate and train, raise funds, raise the profile of the organization, and

⁹⁶ McBride and Gold, “Cryptocurrency,” 3.

⁹⁷ “Bitcoin Foundation,” Wikipedia, accessed September 14, 2019, https://en.wikipedia.org/w/index.php?title=Bitcoin_Foundation&oldid=915611901.

⁹⁸ Edwards, *Social Movements and Protest*.

⁹⁹ The Bitcoin Foundation, “The Bitcoin Foundation Marketing & Operations,” accessed September 15, 2019, <https://bitcoinfoundation.org/marketing>.

facilitate communication and cooperation.¹⁰⁰ Figure 4 displays the Bitcoin’s non-U.S., affiliated non-profit organizations.

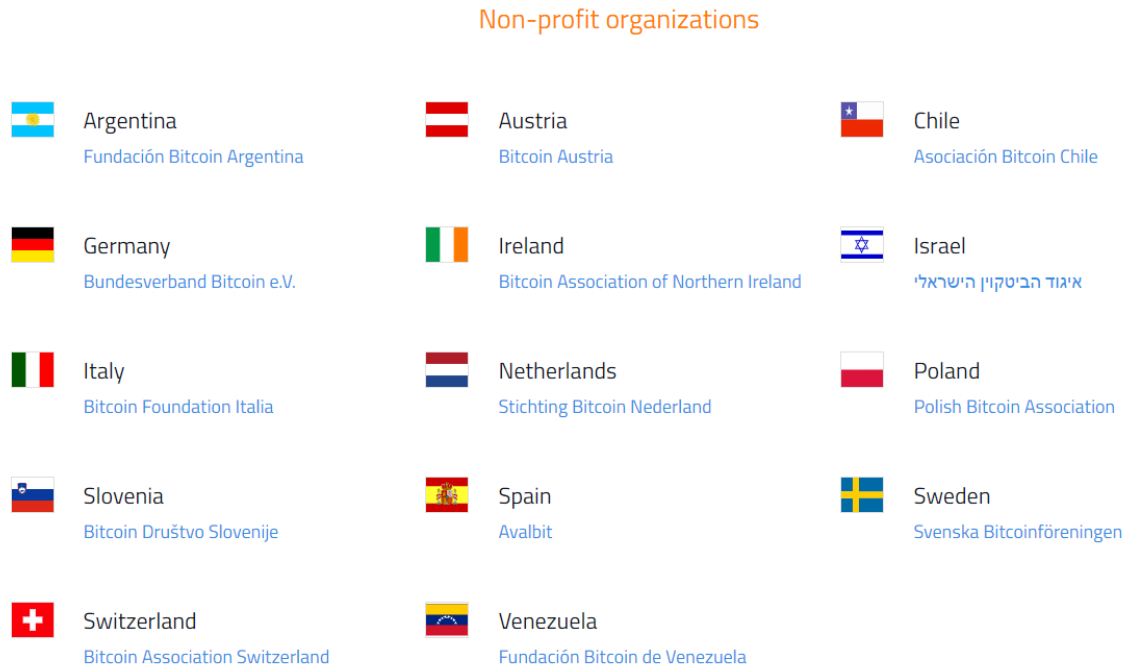


Figure 4. Bitcoin Non-profit Organizations¹⁰¹

The Bitcoin Foundation’s 2018 Marketing and Operations Plan revealed how the SMO endeavored to grow participation and become more visible to effect change globally for Bitcoin and the cryptocurrency industry. The foundation’s marketing plan recognized that the cryptocurrency industry was still immature, and cooperation amongst the new blockchains made more “sense to pool resources against external threats to the industry.”¹⁰² The leadership role envisioned by the Bitcoin Foundation is critical to the cultural framing and mobilization of resources to support the Bitcoin social movement, champion the evolving innovation of the technology and address external threats.

¹⁰⁰ The Bitcoin Foundation; Bitcoin.org, “Bitcoin Communities,” accessed September 28, 2019, <https://bitcoin.org/en/community>.

¹⁰¹ Source: Bitcoin.org, “Bitcoin Communities.”

¹⁰² The Bitcoin Foundation, “The Bitcoin Foundation Marketing & Operations.”

C. IMPACT OF INNOVATION ON BITCOIN SOCIAL MOVEMENT

In David Meyer and Nancy Whittier’s 1994 paper, “Social Movement Spillover,” the authors describe social movements as not being “self-contained and narrowly focused unitary actors, but rather are a collection of formal organizations, informal networks, and unaffiliated individuals engaged in a more or less coherent struggle for change.”¹⁰³ The influence and structure of social movements, as defined by Meyer and Whittier, allow “ideas, tactics, style, participants, and organizations of one movement to *spill over* its boundaries to affect other social movements.”¹⁰⁴ These *spillover effects* allow a social movement to have impacts beyond its stated goals, shaping current and future movements.¹⁰⁵ Innovation occurring inside the cryptocurrency industry and in the external environment is attributable to the Bitcoin social movement, which correlates with Meyer and Whittier’s description of movement spillover effects.

The rapid development of alternative cryptocurrencies and research into additional ways to employ blockchain technology are indicative of the spillover effects from the Bitcoin social movement. The Bitcoin social movement is the starting point for changing the financial industry and the social perception of money as a store of value using technology through the promotion of decentralization, public transparency, privacy through autonomous peer-to-peer transactions, and financial inclusion.¹⁰⁶ The successful creation of Bitcoin and the blockchain ledger has led to the development of over 2000 cryptocurrencies and numerous blockchain platforms such as Ethereum, Invictus Innovations, and Ripple Labs.¹⁰⁷

From a capitalist point of view, the creation of bitcoin alternatives inside the cryptocurrency industry is a form of competition. However, the Bitcoin Foundation views the building of new blockchains as a reflection of “the desires for contributors” (to the

¹⁰³ Meyer and Whittier, “Social Movement Spillover,” 277–78.

¹⁰⁴ Meyer and Whittier, 277–78.

¹⁰⁵ Meyer and Whittier, 277–78.

¹⁰⁶ The Bitcoin Foundation, “The Bitcoin Foundation Marketing & Operations.”

¹⁰⁷ Dodd, “The Social Life of Bitcoin.”; CoinMarketCap, “All Cryptocurrencies.”

overall movement) “to be most productive where they are most valued,” which sometimes means developing “new projects.”¹⁰⁸ The foundation views innovation as furthering Bitcoin’s original goal of creating a global cryptocurrency market, which is recognition of the influence of the spillover effects of Bitcoin on the rest of the industry.

1. Blockchain

The development of new uses for blockchain technology is one of the innovations that is receiving attention in the cryptocurrency community and its external environment. Bitcoin’s blockchain was developed to be decentralized and permissionless, allowing any computer that meets the technical requirements to serve as a validator node and to build applications upon it. Some new blockchains have incorporated Bitcoin’s permissionless model but created new programming languages to address shortfalls in Bitcoin’s programming language. Ethereum is an example of the evolution occurring in blockchain technology. Ethereum, which launched in 2015, use Ether as its native cryptocurrency but is heavily focused on leveraging the technology for decentralized applications, smart contracts, and smart property programs.¹⁰⁹

Research and development of permissioned blockchains are also happening in the cryptocurrency environment and outside of it. Permissioned blockchains restrict validator node access and have the potential to create more centralized communities. Centralization and restricted access are attributes counter to the Bitcoin social movement but are a byproduct of the spillover effects of technology. States, adversarial and non-adversarial, as well as traditional banks are likely researching ways to incorporate permission-based blockchain technology.

¹⁰⁸ The Bitcoin Foundation, “The Bitcoin Foundation Marketing & Operations.”

¹⁰⁹ Buterin, “Next-Generation Smart Contract”; “Ethereum,” in *Wikipedia*, accessed September 10, 2019, <https://en.wikipedia.org/w/index.php?title=Ethereum&oldid=925414142>.

2. The Libra Cryptocurrency

A pending internal innovation in the Bitcoin social movement is the Libra cryptocurrency, which was announced by Facebook leadership on June 18, 2019.¹¹⁰ The Libra cryptocurrency, like Bitcoin, seeks to create “simple global currency and financial infrastructure that empowers billions of people.”¹¹¹ The proposal focuses on three areas “to create a more inclusive financial system”: blockchain, asset-backed reserve, and independent governing body.¹¹²

The Libra Blockchain is the foundation for the Libra currency, which will use an internally developed programming language called Move.¹¹³ The Move programming language leverages knowledge “from security incidents with smart contracts” to create a language that makes it easier to code, which lessens the risk of errors and security incidents.¹¹⁴ Similar to Ethereum, the Libra Blockchain’s software is open source to permit anyone to build applications on top of it for financial transactions and smart contracts. The current proposal states that the Libra Blockchain is “pseudonymous anonymous,” allowing users to have multiple accounts that “are not linked to their real-world identities.”¹¹⁵ The Libra Blockchain will initially launch “as a permissioned blockchain,” then transition to a “permissionless network within five years, of public release, under the guidance of the Libra Association.”¹¹⁶

The pooling of underlying assets to create intrinsic value for the Libra is intriguing but not a new model. It is reminiscent of the gold standard used in the late 19th

¹¹⁰ Mike Isaac and Nathaniel Popper, “Facebook Plans Global Financial System Based on Cryptocurrency,” *The New York Times*, June 18, 2019, sec. Technology, <https://www.nytimes.com/2019/06/18/technology/facebook-cryptocurrency-libra.html>; Libra Association Members, “An Introduction to the Libra,” White Paper, July 23, 2019, <https://libra.org/en-US/white-paper/>; “Libra (Cryptocurrency),” in *Wikipedia*, September 25, 2019, [https://en.wikipedia.org/w/index.php?title=Libra_\(cryptocurrency\)&oldid=917824627](https://en.wikipedia.org/w/index.php?title=Libra_(cryptocurrency)&oldid=917824627).

¹¹¹ Libra Association Members, “An Introduction to the Libra,” 1.

¹¹² Libra Association Members, 1.

¹¹³ Libra Association Members, 1–5.

¹¹⁴ Libra Association Members, 5.

¹¹⁵ Libra Association Members, 6.

¹¹⁶ Libra Association Members, 4.

and 20th century; however, the Libra proposes to use an underlying reserve of “real assets,” in the form of bank deposits and short-term government securities from “stable and reputable central banks.”¹¹⁷ Facebook is striving to have the Libra gain early acceptance by the public by creating a fully asset-backed cryptocurrency. The acceptance of the Libra could enable it to trade competitively on exchanges and boost confidence in the convertibility between the Libra and fiat currencies.¹¹⁸

The Libra’s last unique feature is that it will have an independent governing body, the Libra Association, which is a non-profit membership organization. According to the proposal, the Libra Association is responsible for coordinating and providing a “framework for governance for the network and reserve and lead social impact grant-making in support of financial inclusion.”¹¹⁹ The proposal lists 28 initial “Founding Members” but seeks to have approximately 100 members before the launch of the cryptocurrency network.¹²⁰ The governing aspect of the Libra is the most radical in the evolution of the Bitcoin social movement as it introduces a form of centralization, control, and organizational structure that has hierarchical characteristics typically eschewed within the movement.

Like other cryptocurrencies developed after the creation of Bitcoin, the Libra is the latest example of social movement spillover into the corporate sector. Conceptually, the Libra builds and improves upon the experiences of past projects of Bitcoin and other cryptocurrencies and blockchains. The head of Facebook’s blockchain technology research is David Marcus, who was previously the president of PayPal, which is an alternative payment system.¹²¹ Marcus is likely not the only member of the Libra project team who previously worked for an alternative payment company or cryptocurrency

¹¹⁷ Isaac and Popper, “Facebook Plans Global Financial System Based on Cryptocurrency”; Libra Association Members, “An Introduction to the Libra,” 7.

¹¹⁸ Libra Association Members, “An Introduction to the Libra,” 7.

¹¹⁹ Libra Association Members, 3–4.

¹²⁰ Libra Association Members, 4.

¹²¹ Isaac and Popper, “Facebook Plans Global Financial System Based on Cryptocurrency.”

community. The spillover of experienced personnel will allow the Libra to benefit from ideas and lessons learned from other organizations within the broader social movement.

The Libra cryptocurrency project is an idea that has come under significant scrutiny in the United States and some European countries. Facebook Chief Executive Officer (CEO) Mark Zuckerberg released an official statement and testified before Congress that the company “will not be a part of launching the Libra payments system anywhere in the world unless all U.S. regulators approve it.”¹²² At issue are concerns over Facebook’s ability to prevent the use of the Libra in assets money laundering, the potential to lessen U.S. financial strength, and Facebook’s history of corporate governance and handling of data. All are legitimate grievances from the U.S. governmental viewpoint. However, an issue raised by Zuckerberg during his testimony, that the U.S. needs to innovate its financial system to remain the global leader, was overshadowed because it is Facebook that is leading a radical change in the cryptocurrency movement.

Authors Sara Dudley, Travis Pond, Ryan Roseberry, and Shawn Carden warn of the potential of adversarial states “establishing an adaptive parallel digital currency world marketplace” and recommend the U.S. seek to lead change from a “first-mover advantage.”¹²³ U.S. government policymakers appear content with defending the current global financial system, instead of leading innovative change that builds consensus to enable cryptocurrency and other digital asset-related technologies to coexist with the United States Dollar (USD) led fiat-based system. Dudley et al. also describe cryptocurrency as a revolution, which supports this analysis of Bitcoin as a social movement. Currently, China and other adversarial states are investing in research and development of state currencies and blockchain technology to lessen the economic

¹²² Barbara Ortutay, “Facebook Says Libra Won’t Launch without U.S. Approval,” *Seattle Times*, October 22, 2019, <https://www.seattletimes.com/business/facebook-says-libra-wont-launch-without-us-approval/>; Lucas Mearian, “Facebook Won’t Launch Cryptocurrency until U.S. Regulators Approve,” *Computerworld*, October 22, 2019, <https://www.computerworld.com/article/3447678/facebook-wont-launch-cryptocurrency-until-us-regulators-approve.html>.

¹²³ Sara Dudley et al., “Evasive Maneuvers: How Malign Actors Leverage Cryptocurrency,” National Defense University Press, 63, January 2019, <http://ndupress.ndu.edu/Media/News/News-Article-View/Article/1738242/evasive-maneuvers-how-malign-actors-leverage-cryptocurrency/>.

influence of the United States, which we discuss in Chapter Three. Strictly focusing on regulatory concerns and tightening anti-money laundering laws that restrict the development of legitimate uses of the technology will lead to nefarious actors gaining an advantage in the development of cryptocurrency technology.

Innovation and adaptation are vital for the longevity of any social movement, to include the Bitcoin social movement. Defensive measures like stringent legislation, cyber-raids on cryptocurrency wallets, and the framing of cryptocurrency as tools for criminal organizations and terrorists are akin to the tactics used in the past by states and corporations to resist changes to the status quo. The Libra proposal represents a unique challenge to the status quo because of the unknown effects it may or may not have on U.S. financial hegemony. If viewed through a social movement lens, then the evolution occurring within the cryptocurrency movement is not losing momentum. Thus, the continued focus on defensive measure rather than offensive operational uses lessens opportunities for collaborative development of the technology and use in future operations.

3. The Future of the Bitcoin Cryptocurrency Movement

Bitcoin is a social movement that has sparked debate and challenges the status quo of the current financial system. Applying Social Movement Theory to Bitcoin allows for a better understanding of the social change to the financial industry that sought through the Bitcoin social movement. Although the Bitcoin social movement began and remains decentralized and informally organized, over the past decade, it has developed formal social movement organizations like the Bitcoin Foundation. The Bitcoin Foundation seeks to respond to increased scrutiny from governments, to regain control of the narrative associated with the movement, and to promote cooperation towards changing the financial industry.

In this section, we focused on the Bitcoin social movement and the innovations occurring within the broader cryptocurrency movement. The Libra cryptocurrency represents an evolution in the cryptocurrency movement to change the financial industry. If launched, the Libra could spark wider acceptance for a digital asset payment system. In

the next section, we look at external threats that may impact the future of the industry. Specifically, we focus on state and non-state activities to develop or manipulate existing cryptocurrencies, governmental regulation, increase adoption, and prevent illicit activities, which pose different challenges to the social movement.

III. SOVEREIGN NATIONS, ADVERSARIAL STATES AND NON-STATE ACTORS

As the United States continues to apply pressure on adversarial states through economic sanctions and continues to delegitimize and disrupt non-state actors through military operations around the globe, we have seen a rise in Bitcoin and cryptocurrency usage.¹²⁴ Nation states are leveraging cryptocurrency in several ways, whether it is to revitalize their economies or to circumvent sanctions by the United States and her allies.¹²⁵ Non-state actors are also using cryptocurrencies like Bitcoin to crowdsource from sympathizers to procure equipment and supplies required for their operations.¹²⁶ The authors will draw attention to various nation states and non-state actors and their methods of leveraging cryptocurrencies for flagitious reasons.

A. SOVEREIGN NATIONS AND THEIR USE OF CRYPTOCURRENCIES

Bitcoin and blockchain technology have increased in popularity over the last six years and influenced some sovereign countries to consider the use of cryptocurrencies as a way to improve transparency within their financial systems.¹²⁷ In 2013, a young Afghani entrepreneur, Roya Mahboob, started a digital media company in Herat and later moved it to Kabul for security concerns, paying her employees in Bitcoin since the majority did not have bank accounts.¹²⁸ In 2019, the governments of Afghanistan,

¹²⁴ Gourang Aggarwal et al., “Understanding the Social Factors Affecting the Cryptocurrency Market,” *ArXiv:1901.06245 [Cs]*, January 13, 2019, 1, <http://arxiv.org/abs/1901.06245>.

¹²⁵ Deane R Konowicz, “The New Game: Cryptocurrency Challenges U.S. Economic Sanctions” (Newport, RI: U.S. Naval War College, February 18, 2018), 4.

¹²⁶ Nathaniel Popper, “Terrorists Turn to Bitcoin for Funding, and They’re Learning Fast,” *New York Times*, August 18, 2019, <https://www.nytimes.com/2019/08/18/technology/terrorists-bitcoin.html>.

¹²⁷ Enrique Aldaz-Carroll and Eduardo Aldaz-Carroll, “Can Cryptocurrencies and Blockchain Help Fight Corruption?,” Brookings, February 1, 2018, <https://www.brookings.edu/blog/future-development/2018/02/01/can-cryptocurrencies-and-blockchain-help-fight-corruption/>.

¹²⁸ Laura Shin, “How Bitcoin Solved This Serial Entrepreneur’s Problems,” *Forbes*, August 8, 2019, <https://www.forbes.com/sites/laurashin/2017/08/08/how-bitcoin-solved-this-serial-entrepreneurs-problems/>.

Tunisia and Uzbekistan considered possibly introducing a Bitcoin based bond through an informal proposal to the International Monetary Fund director, Christine Lagarde.¹²⁹

Early in 2019, Paraguay bought commercial goods from Argentina through a cross border payment in Bitcoin.¹³⁰ Although the amount (\$7,100 USD) is not significant in terms of international trade, this event warrants mentioning as more sovereign countries recognize the increased transparency and ability to mitigate corruption through the usage of cryptocurrencies, such as Bitcoin.¹³¹

Even more recently, Bitcoin's usage in Venezuela has risen as its economy has suffered from harsh international sanctions and a brutal dictatorship.¹³² The Maduro regime developed a government controlled centralized cryptocurrency called the Petro in early 2018, to counter the rise in Bitcoin usage within Venezuela. The Venezuelan government claimed the Petro was backed by 5 billion barrels of oil, or the equivalent of one Petro for one barrel of oil.¹³³ It is believed that Russia was the key influence behind Venezuela's Petro development to aid Venezuela in the evasion of severe United States sanctions.¹³⁴

A similar trend is growing in sovereign nations as they attempt to add transparency to counter corruption within their respective economic spheres and to

¹²⁹ "Afghanistan Considers Issuing Bitcoin Bond," Daily Outlook Afghanistan, April 21, 2019, http://outlookafghanistan.net/national_detail.php?post_id=23449.

¹³⁰ Global Ethical Banking, "Argentina And Paraguay Settle Exports Deal Using Bitcoin," Global Ethical Banking, February 19, 2019, <http://www.globalethicalbanking.com/argentina-paraguay-settle-exports-deal-using-bitcoin/>.

¹³¹ Global Ethical Banking "Argentina And Paraguay Settle Exports Deal Using Bitcoin."

¹³² Saul Hudson, "Venezuelans Reach for Bitcoin as Lifeline to Weather the Nation's Economic Crisis," *Newsweek*, April 22, 2019, <https://www.newsweek.com/venezuela-economic-crisis-perfect-storm-bitcoin-lifeline-opinion-1402684>.

¹³³ Usman W. Chohan, "Cryptocurrencies as Asset-Backed Instruments: The Venezuelan Petro," Discussion Paper Series: Notes on the 21 St Century (University of New South Wales, Canberra, February 7, 2018), 3.

¹³⁴ "Exclusive: Russia Secretly Helped Venezuela Launch a Cryptocurrency to Evade U.S. Sanctions," *Time*, accessed October 18, 2019, <https://time.com/5206835/exclusive-russia-petro-venezuela-cryptocurrency/>.

increase their access to the global financial markets.¹³⁵ Unfortunately, the trend is also growing in adversarial nation states in order to elude and erode United States and international sanctions. The United States and allies need to address this issue before our adversaries establish an alternate global financial network that undermines the United States dollar and Society for Worldwide Interbank Financial Telecommunication (SWIFT).

B. ADVERSARIAL NATION STATES AND THEIR USE OF CRYPTOCURRENCIES

1. China

The government of the People's Republic of China has enacted strict regulations on cryptocurrencies since 2013 despite being home to the largest community of Bitcoin miners.¹³⁶ China bars involvement in virtual currency by its financial institutions and has banned foreign entities from conducting transactions with virtual currency on the mainland.¹³⁷ Cryptocurrency is recognized as legal virtual property in China but cannot be exchanged for fiat currency.¹³⁸

In 2016, the People's Bank of China (PBoC), the Chinese Central Bank, announced it would develop a centralized digital currency in an effort to allow the Chinese government to more effectively regulate an internal digital currency market.¹³⁹ The Chinese digital currency is expected to be released by Spring of 2020 and will not be

¹³⁵ Evelyn Cheng, "Bitcoin Bond Launch Brings Digital Currency Step Closer to 'World of High Finance,'" CNBC, August 17, 2017, <https://www.cnbc.com/2017/08/17/bitcoin-bond-launch-brings-digital-currency-step-closer-to-high-finance.html>.

¹³⁶ Max De Jonge and Daan De Jonge, "A Brief Overview on China and Cryptocurrency," *Ningbo Economic Review*, Insights Essay, no. 1 (April 2018): 33.

¹³⁷ Dovey Wan, "Cryptocurrency in China: Over the Counter, Under the Table," CoinDesk, August 5, 2019, <https://www.coindesk.com/cryptocurrency-in-china-over-the-counter-under-the-table>.

¹³⁸ Wan, "Cryptocurrency in China"

¹³⁹ Jonge and Jonge, "A Brief Overview on China and Cryptocurrency," 35.

the same as a cryptocurrency in the sense that the currency will not be based on blockchain technology.¹⁴⁰

However, China's government has had a recent shift in perception towards blockchain technology, as the government has stated it now wants to embrace blockchain technology and is urging its commercial banks to increase their use of blockchain technology.¹⁴¹ All signs point to China as taking a large step forward towards blockchain technology and integration within all functions of society.

As China aims to take a leading role with the new push towards blockchain technology development, a role that would provide them with "new industrial advantages and allow China to seize the initiative of blockchain technology integration, function expansion and industry segmentation."¹⁴² The Chinese government has also started to ban articles that promote anti-blockchain technology sentiment since publicly embracing the technology.¹⁴³

Given the acceleration of China's plans for a state backed global cryptocurrency, the United States will need to reconsider projects like Facebook's Libra and allow them to move forward. During a recent hearing regarding the Libra cryptocurrency in front of the House Financial Services Committee, the CEO of Facebook, Mark Zuckerberg gave a stern warning to U.S. lawmakers "while we debate these issues, the rest of the world isn't waiting"—referencing China and Russia's ambitions within the cryptocurrency space.¹⁴⁴ Former and current presidents of the New York and Philadelphia Federal Reserves, William Dudley and Patrick Harker, the former chairman of the U.S. Commodities

¹⁴⁰ Roger Huang, "China's Digital Currency Is Unlikely To Be A Cryptocurrency," *Forbes*, October 18, 2019, <https://www.forbes.com/sites/rogerhuang/2019/08/14/chinas-digital-currency-is-unlikely-to-be-a-cryptocurrency/>.

¹⁴¹ "Xi Stresses Development, Application of Blockchain Technology," *XinhuaNet*, October 25, 2019, http://www.xinhuanet.com/english/2019-10/25/c_138503254.htm.

¹⁴² "Xi Stresses Development, Application of Blockchain Technology."

¹⁴³ Anthony Cuthbertson, "China Bans Anti-Blockchain Sentiment and Prepares to Launch Its Own Cryptocurrency," *The Independent*, October 30, 2019, <https://www.independent.co.uk/life-style/gadgets-and-tech/news/china-cryptocurrency-blockchain-bitcoin-a9176636.html>

¹⁴⁴ April Glaser, "Why Mark Zuckerberg Keeps Saying Facebook Needs to Win Against China," *Slate Magazine*, October 23, 2019, <https://slate.com/technology/2019/10/mark-zuckerberg-facebook-libra-cryptocurrency-china-free-speech.html>.

Futures Trading Commission, J. Christopher Giancarlo, and a Federal Reserve Board Governor and notable President Trump nominee, Judy Shelton, all have advocated for a U.S. government backed cryptocurrency publicly dating back to 2017.¹⁴⁵

2. Iran

In April of 2018, the Central Bank of Iran announced it would prohibit all legal use of cryptocurrencies, and then in 2019, the Iranian government legalized cryptocurrency mining, albeit with an expensive tax on energy consumption.¹⁴⁶ Iran's state subsidized electricity is attractive to cryptocurrency miners, which is relatively cheap despite the additional tax the government has emplaced on cryptocurrency mining businesses.¹⁴⁷

Iran has also developed and released its own cryptocurrency, the Peyman, which is said to be backed by gold.¹⁴⁸ The development of the Peyman has led to speculation that Iran will develop its own state-controlled cryptocurrency to join the rising number of countries who attempt to evade United States and international sanctions.¹⁴⁹ If U.S. diplomatic efforts with Iran continue to falter, one would expect Iran to go ahead with their own state-backed cryptocurrency in efforts to gain access to the international financial system.

¹⁴⁵ Jeff Cox, "Federal Reserve Starting to Think about Its Own Digital Currency, Dudley Says," CNBC, November 29, 2017, <https://www.cnbc.com/2017/11/29/federal-reserve-starting-to-think-about-its-own-digital-currency-dudley-says.html>; "Fed-Backed Digital Currency Is Inevitable | American Banker," accessed October 30, 2019, <https://www.americanbanker.com/opinion/fed-backed-digital-currency-is-inevitable>; Josiah Wilmoth, "Cryptocurrency Is 'Here to Stay': CFTC Chairman Giancarlo," CCN, October 2, 2018, <https://www.ccn.com/cryptocurrency-is-here-to-stay-cftc-chairman-giancarlo>; "The Case for a New International Monetary System," Cato Institute, April 30, 2018, <https://www.cato.org/cato-journal/springsummer-2018/case-new-international-monetary-system>.

¹⁴⁶ Maziar Motamedi, "Iran's Government Recognises Cryptocurrency Mining with Caveat," August 4, 2019, <https://www.aljazeera.com/ajimpact/iran-government-recognises-cryptocurrency-mining-caveat-190804193912792.html>.

¹⁴⁷ McBride and Gold, "Cryptocurrency," 19.

¹⁴⁸ Mark Emem, "Iran Launches Gold-Backed Cryptocurrency as Anticipation for Crypto-Rial Grows to Evade U.S. Sanctions," CCN.com, January 31, 2019, <https://www.ccn.com/iran-launches-gold-backed-cryptocurrency-as-anticipation-for-crypto-rial-grows-to-evade-us-sanctions/>.

¹⁴⁹ Emem, "Iran Launches Gold-Backed Cryptocurrency."

3. Russia

In July of 2019, the Foundation for Defense of Democracies (FDD) released a report, which stated Russia is “prioritizing the advancement of blockchain technology as a long-term economic and national security goal to lessen the impact of United States and international sanctions”.¹⁵⁰ FDD identified seven Russian financial institutions leveraging blockchain technology through eight projects to bypass the SWIFT network and avoid United States and international sanctions.¹⁵¹ Russia has been actively involved in the blockchain and cryptocurrency technology space dating back to 2015 and the Russian government is expected to ease regulations within the space to allow its citizens to legally trade cryptocurrencies, potentially adding in excess of 1.5 billion USD to the global cryptocurrency market.¹⁵²

Russian arms manufacturers have leveraged cryptocurrencies in an attempt to bypass United States sanctions and the SWIFT network.¹⁵³ As Major Chris Telley elegantly put it “Vladimir Putin has exploited social media to disrupt affairs abroad while sustaining his grip on domestic power. Cryptocurrencies provide an equivalent capability.”¹⁵⁴ The world is rapidly evolving within the digital space and Russia is ensuring that they capture the brisk innovations within the blockchain and cryptocurrency technology space and attempting to examine how to incorporate the technology in their national strategy.¹⁵⁵

¹⁵⁰ Yaya Fanusie and Trevor Logan, “Crypto Rogues,” FDD, July 11, 2019, 11, <https://www.fdd.org/analysis/2019/07/11/crypto-rogues/>.

¹⁵¹ Fanusie and Logan, “Crypto Rogues,” 24–25.

¹⁵² Viktor Barkhatov, Ekaterina Lymar, and Ivan Koptelov, “The Interrelation And Interaction Of Financial Markets With Financial Cycles Of The National Economy Of Russia,” *CBU International Conference Proceedings* 7 (September 30, 2019): 5, <https://doi.org/10.12955/cbup.v7.1336>.

¹⁵³ Ken Chigbo, “Russian Arms Producer to Use Bitcoin to Bypass Sanctions,” *FXStreet*, July 29, 2019, <https://www.fxstreet.com/cryptocurrencies/news/russian-arms-producer-to-use-bitcoin-to-bypass-sanctions-201907291503>.

¹⁵⁴ Chris Telley, “A Coin for the Tsar: The Two Disruptive Sides of Cryptocurrency,” *Small Wars Journal*, accessed October 18, 2019, <https://smallwarsjournal.com/jrnl/art/coin-tsar-two-disruptive-sides-cryptocurrency>.

¹⁵⁵ Nicholas Ross Smith, “Could Russia Utilize Cryptocurrencies in Its Foreign Policy Grand Strategizing?,” *Russia in Global Affairs* 17, no. 2 (2019): 145–47, <https://doi.org/10.31278/1810-6374-2019-17-2-134-152>.

Russia views blockchain technology as its opportunity to *even the playing field* when it comes to global commerce and financial markets, as one former Russian Federal Security Service agent was quoted as saying, “The internet belongs to the Americans, but blockchain will belong to us.”¹⁵⁶ Russia intends to lead a blockchain technology-based network as an alternative to the SWIFT network, in which Iran has expressed interest in being a partner.¹⁵⁷ Given the inability to adequately sanction decentralized cryptocurrencies and blockchain technology as a whole, Moscow appears poised to make an effort to lead the adversaries’ blockchain version of a new SWIFT network.

4. Democratic People’s Republic of Korea (DPRK)

North Korea seeks to develop a Central Bank controlled state cryptocurrency following the examples of Venezuela, China, Iran and Russia.¹⁵⁸ Experts are calling the DPRK currency Pyongyang coin. Five days after the United States announced a new round of sanctions on North Korea, it was reported that Pyongyang would begin the process of developing a state-backed cryptocurrency to exploit the ineffective United States economic sanctions.¹⁵⁹ The traditional methods that sovereign states use to sanction adversarial states have little to any effect in the cyber realm, specifically when it comes to blockchain technology and cryptocurrency’s ability to send monetary value across international borders.

North Korea has also been behind several malign activities, ranging from malware and ransomware to major cryptocurrency exchange hacks, amassing upwards to \$2 billion USD in value.¹⁶⁰ North Korea sends personnel to China to learn how to hack,

¹⁵⁶ Nathaniel Popper, “Blockchain Will Be Theirs, Russian Spy Boasted at Conference,” *The New York Times*, April 29, 2018, sec. Technology, <https://www.nytimes.com/2018/04/29/technology/blockchain-iso-russian-spies.html>.

¹⁵⁷ Fanusie and Logan, “Crypto Rogues,” 14.

¹⁵⁸ Kollen Post, “‘Pyongyang Coin’ and the Future of U.S. Sanctions on North Korea - Foreign Policy Research Institute,” <https://www.fpri.org/>, October 8, 2019, <https://www.fpri.org/article/2019/10/pyongyang-coin-and-the-future-of-u-s-sanctions-on-north-korea/>.

¹⁵⁹ Post, “‘Pyongyang Coin’.”

¹⁶⁰ United Nations Security Council, “United Nations Report on Democratic People’s Republic of Korea and DPRK’s Involvement in Illicit Cyberactivity” (New York, NY: United Nations, March 12, 2019), 49–51, <https://undocs.org/S/2019/171>.

then disperses the newly trained hackers across the globe and within the DPRK.¹⁶¹ In March 2019, the United Nations Security Council (UNSC) released a 379 page report detailing a year-long investigation into North Korea and its illicit activities to fund their weapons of mass destruction program. The report states the UNSC is investigating at least 35 DPRK citizens across 17 countries, who have been involved in the DPRK's maligned cyberactivity.¹⁶²

Pyongyang has made a concerted effort across the cyber domain to conduct deleterious attacks to solicit funding for their nuclear weapons program. Cryptocurrency has become a vital source of revenue through their reprehensible cyber actions. It is reasonable to expect North Korea to ramp up their use of cryptocurrencies to continue evading United States and international sanctions.

C. NON-STATE ACTORS

Non-state actors such as al Qaeda (AQ), Islamic State of Iraq and Syria (ISIS), Hezbollah, Hamas and others are leveraging cryptocurrencies in a variety of ways. All have been known to crowdsource for funding, predominantly through pamphlets and advertisements that include a Bitcoin wallet address.¹⁶³ Upon receipt of the Bitcoin or other cryptocurrency, the non-state actor can then sell the cryptocurrency on a myriad of global cryptocurrency exchanges, cryptocurrency mobile apps that allow for quick purchasing and selling of cryptocurrencies or pay a vendor directly with the cryptocurrency via an app and a quick response (QR) code on their mobile phone.¹⁶⁴ The

¹⁶¹ Post, “‘Pyongyang Coin’.”

¹⁶² United Nations Security Council, “United Nations Report on Democratic People’s Republic of Korea and DPRK’s Involvement in Illicit Cyberactivity”; “Global Malware Campaign Pilfers Data from Critical Infrastructure, Entertainment, Finance, Health Care, and Other Industries,” McAfee Blogs, April 25, 2018, <https://securingtomorrow.mcafee.com/other-blogs/mcafee-labs/global-malware-campaign-pilfers-data-from-critical-infrastructure-entertainment-finance-health-care-and-other-industries/>.

¹⁶³ Yaya Fanusie, “Hamas Military Wing Crowdfunding Bitcoin,” Forbes, February 2019, <https://www.forbes.com/sites/yayafanusie/2019/02/04/hamas-military-wing-crowdfunding-bitcoin/>; Steve Stalinsky, “Drive for Donations Using Bitcoin on an ISIS-Affiliated website,” February 2, 2019, <https://www.terrorism-info.org.il/en/drive-donations-using-bitcoin-isis-affiliated-website/>; Cynthia Dion-Schwarz, *Terrorist Use of Cryptocurrencies: Technical and Organizational Barriers and Future Threats* (Santa Monica, Calif: RAND Corporation, 2019).

¹⁶⁴ Stalinsky, “Drive for Donations Using Bitcoin.”

non-state actor can then buy drugs, weapons and other equipment and supplies needed to support day-to-day operations. Individual terrorists can also use cryptocurrencies to send and receive money from family and friends without going through the traditional financial system and risk having their funds frozen. With the rise of anonymous cryptocurrencies such as Monero, these transactions have become increasingly difficult to monitor. Dion-Schwarz highlights the key components of illicit cryptocurrency usage in Table 1.

Table 1. Non-state Actors' Cryptocurrency Activities¹⁶⁵

Activity Name	Key Components of Activity in Finance
Fundraising	Receipt of support from donors, especially cash support
Illegal drug and arms trafficking	Income source
Remittance and transfer of funds	Sending or receiving of funds to support organizational activities
Attack funding	Direct purchase of materiel to support terrorist attacks and financial support of attack operations
Operational funding	Use of funds to support day-to-day operations, to include general security, communications and management

1. al Qaeda and Affiliates

Since 2001, the United States and its allies have levied financial sanctions towards individuals affiliated with AQ, which sequentially made it extremely difficult for AQ to raise and transfer money around the world. Cryptocurrencies are not al Qaeda's main source of revenue, as AQ still resorts to traditional money laundering and establishing illegal checkpoints in areas in which they operate. Airport and border checkpoints were the most profitable as AQ knew the majority of the people coming in

¹⁶⁵ Adapted from Dion-Schwarz, *Terrorist Use of Cryptocurrencies*, 15.

have money. The people walking or driving through the border checkpoint or arriving at the local airport would be forced to pay a tax for coming into the country.¹⁶⁶

Due to the conflict areas becoming extremely difficult to conduct fiat transfers, AQ in 2014 (and ISIS) would begin asking for cryptocurrency donations, predominantly Bitcoin.¹⁶⁷ The inability to send and receive money from family and friends became rather cumbersome for the terrorists, forcing them to be creative and over time discover Bitcoin to skirt the sanctions.¹⁶⁸ As terrorists were early to embrace social media, they have embraced and weaponized cryptocurrencies as tool to avoid financial sanctions from the United States and allies.¹⁶⁹

2. Islamic State of Iraq and Syria (ISIS) and Affiliates

Much like AQ, ISIS historically has generated most of its funding from the resources in the areas in which it controlled.¹⁷⁰ After AQ begin accepting Bitcoin donations in 2016, ISIS mimicked AQ and began its own Bitcoin donation campaign.¹⁷¹ ISIS, as well as the other non-state actors, benefit from drug and human trafficking and other illegal items on the dark web, which cryptocurrency plays a significant role within the dark web payment structure.¹⁷²

¹⁶⁶ Juan Carlos Zarate, *Treasury's War: The Unleashing of a New Era of Financial Warfare*, First Edition (New York: Public Affairs, 2013), 195, 363.

¹⁶⁷ Steve Stalinsky, "Terrorists Have Been Using Bitcoin for Four Years, so What's the Surprise? | The Hill," March 8, 2018, <https://thehill.com/opinion/cybersecurity/377415-terrorists-have-been-using-bitcoin-for-four-years-so-whats-the-surprise>.

¹⁶⁸ Rita Katz, "The Bitcoin Jihad in Syria and Beyond: Tales of Crypto-Currency," October 13, 2019, <https://www.thedailybeast.com/the-bitcoin-jihad-in-syria-and-beyond-theses-of-crypto-currency>.

¹⁶⁹ Katz, "The Bitcoin Jihad in Syria."

¹⁷⁰ Dion-Schwarz, *Terrorist Use of Cryptocurrencies*, 8–9.

¹⁷¹ Dion-Schwarz, 9.

¹⁷² Dion-Schwarz, *Terrorist Use of Cryptocurrencies*, 10; Seunghyeon Lee et al., "Cybercriminal Minds: An Investigative Study of Cryptocurrency Abuses in the Dark Web," in *Proceedings 2019 Network and Distributed System Security Symposium* (Network and Distributed System Security Symposium, San Diego, CA: Internet Society, 2019), 1, <https://doi.org/10.14722/ndss.2019.23055>.

3. Hezbollah

Historically, Hezbollah has relied on financial support from Iran, but with the strident sanctions levied by the United States and other allied nations, it has become burdensome for Iran to conduct cross border fiat transactions.¹⁷³ As in traditional non-state actor fashion, Hezbollah also gets a large percentage of their funding through drug trafficking and money laundering throughout affiliated groups globally.¹⁷⁴ It is plausible that the current sanctions towards Iran will not be lifted within the next one to two years, given the current state of diplomatic affairs between the United States and Iran. Given the financial hardship caused by the sanctions, it would not be surprising to see Hezbollah ramp up their crowdsourcing campaign for cryptocurrency donations.

4. Hamas

In the spring of 2019, the al-Qassam Brigades (AQB), an armed wing of Hamas, began using a complex method for its cryptocurrency crowdsourcing campaign. Instead of using a single wallet address for a large number of Bitcoin donations, AQB has developed a website that creates a new wallet address for every single donation.¹⁷⁵ The creation of a new Bitcoin wallet address makes it extremely difficult for companies like Chainalysis and Ciphertrace to track activity on Bitcoin's blockchain. Whereas if an entity sticks to using a single Bitcoin wallet address, blockchain analysts can trace the activity on the blockchain and have the wallet address flagged to have cryptocurrency exchanges freeze the entity's cryptocurrency funds.¹⁷⁶ Although AQB has only made around \$15000 in Bitcoin (adjusted to current day Bitcoin prices), this tactic of designing a website and having it generate a new wallet address for every single donation is a way of weaponizing cryptocurrency.¹⁷⁷

¹⁷³ Dion-Schwarz, *Terrorist Use of Cryptocurrencies*, 18.

¹⁷⁴ Dion-Schwarz, 19.

¹⁷⁵ Tom Wilson and Dan Williams, "Hamas Shifts Tactics in Bitcoin Fundraising, Highlighting Crypto Risks: Research," Reuters, April 25, 2019, <https://www.reuters.com/article/us-crypto-currencies-hamas-idUSKCN1S20FA>.

¹⁷⁶ Wilson and Williams, "Hamas Shifts Tactics in Bitcoin Fundraising."

¹⁷⁷ Wilson and Williams.

D. SYNOPSIS

The United States relies on the SWIFT system to support its sanction authority to discourage nation states from conducting illegal activities. Cryptocurrency provides a means to avoid United States sanction, if there is no universal agreement among nation states on the acceptable use of the alternative financial instruments. The current environment surrounding cryptocurrency allows Russia, Iran and North Korea to conduct illicit cyber activity aimed at avoiding United States sanctions, which will likely increase if left unchecked. The United States and allies need to improve their ability to better analyze blockchain activity and the flow of cryptocurrency in order to counter the illicit usage of cryptocurrencies. Organizations like Chainalysis, Ciphertrace and Elliptic are becoming crucial to the fight against adversarial nation states and non-state actors who are leveraging cryptocurrencies to skirt United States and allied sanctions and detection.

The United States has made strides in curbing the illicit activity of adversarial state and non-state actors through the Department of Treasury's Office of Foreign Asset Control (OFAC), anti-money laundering laws, and Financial Crimes Enforcement Network (FINCEN). OFAC has worked with FINCEN to reduce illegal activities involving cryptocurrency by blacklisting cryptocurrency wallet addresses, which prevents further activity within the accounts freezing funds held in the United States. However, problems arise once the adversary begins to use new wallet addresses for every transaction or cryptocurrency mixers and anonymous wallets. Mixers simply accept the user's transaction and then mix it with up to hundreds of thousands of other transactions, making it extremely difficult to track on the blockchain.¹⁷⁸ Anonymous wallets are essentially cryptocurrency wallets with the mixer option added, so every time cryptocurrency is transferred into the anonymous wallet, it is automatically mixed, adding to the difficulty to track on the blockchain.¹⁷⁹

The Department of Defense should invest in its own personnel, specifically within the United States Army Special Operations Command, to learn skillsets that would

¹⁷⁸ Yuriy Kudlovich, "How Cryptocurrency Mixers and Anonymous Wallets Work," January 17, 2018, <https://decenter.org/en/how-cryptocurrency-mixers-and-anonymous-wallets-work>.

¹⁷⁹ Kudlovich, "How Cryptocurrency Mixers and Anonymous Wallets Work."

provide special operations forces (SOF) elements the capability to monitor and track activity on various cryptocurrency blockchains. This ability would provide SOF and Conventional Force commanders a more coherent picture of what the enemy is doing financially on the battlefield.

If the United States fails to deal with the rising global usage of cryptocurrency, it is inevitable that adversaries, state and non-state alike, will increase their leveraging of cryptocurrencies. Also, by ignoring this growing technology, the United States is inadvertently ignoring the following tasks and subtasks within the 2017 United States National Security Strategy¹⁸⁰:

- Pillar I: Protect the American People, the Homeland, and the American Way of Life
 - Pursue Threats to Their Source
- Pillar II: Promote American Prosperity
 - Lead in Research, Technology, Invention, and Innovation
- Pillar III: Promote Peace Through Strength
 - Renew America's Competitive Advantages
 - Renew Capabilities
 - Military
 - Cyberspace
 - Intelligence
 - Diplomacy and Statecraft

¹⁸⁰ White House, *National Security Strategy of the United States of America* (Washington, DC: Executive Office of the President, December 18, 2017), V–VI, <https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf>.

- Tools of Economic Diplomacy
- Pillar IV: Advance American Influence
 - Achieve Better Outcomes in Multilateral Forums
 - Champion American Values

Each of these tasks and subtasks can be positively influenced by a decisive and proactive approach towards the rising cryptocurrency social movement. With Russia's aspirations of a cryptocurrency centric variant of the SWIFT network and China's recently embrace of blockchain technology, the United States needs to act quickly to ensure that our adversaries do not gain and maintain the competitive advantage within the cryptocurrency space.

If the United States fails to act in a timely manner, it will become increasingly difficult to stop Russia's pursuit of a financial network independent of the SWIFT network. Russia would be able to expand its financial reach to markets that are typically off limits due to sanctions that prohibit or limit their interaction through the SWIFT network. If China becomes the first nation state with a government backed cryptocurrency, China could expand their Belt and Road Initiative and increase their financial standing globally. This would pose significant obstacles for the United States to overcome if the United States attempts to digitize the U.S. dollar at some point in the near future. The United States should expedite its efforts to counter the aforementioned quagmires that adversarial state and non-state actors present within the cryptocurrency space. If the United States opts to act in a reasonable timeframe, it is probable that the United States could cripple the efforts of Russia and China as they attempt to move forward with their cryptocurrency ambitions.

IV. BITCOIN ON THE BATTLEFIELD

In this chapter, the authors project into the future based on the premise that there is continued evolution in the Bitcoin social movement, which leads to wider acceptance of cryptocurrency, and how increased usage of cryptocurrency could impact its future Special Operations missions. The thought experiment focuses on how United States Army Civil Affairs from the 95th Civil Affairs (CA) Brigade traditionally uses cash to influence as well as leverage opportunities to aid in the gathering of information and expanding access. At the height of the 2008 global financial crisis, many investors were left ruined and no decisive action was taken to repair the damage done by the banks.¹⁸¹ The *Great Recession* led people to begin looking elsewhere for answers due to the failure of the global financial system.¹⁸² Enter Satoshi Nakamoto and the development of Bitcoin. Nakamoto developed Bitcoin in 2008, with the genesis block being mined in January of 2009, providing the world with a new way of transacting across international boundaries without the need for financial intermediaries such as banks. Nakamoto and the cypherpunks had provided the world a decentralized monetary option through Bitcoin, the newly developed distributed ledger technology, in which all transactions are recorded and available for the public to view. The social movement would begin after the collapse of the large investment bank Lehman Brothers, as it would lead to a trust deficit between financial institutions and the private investor—due to their centralized nature, high transaction fees and perceived lack of transparency.¹⁸³ The latter was what Nakamoto hoped to resolve with the innovation of Bitcoin.

The 95th Civil Affairs Brigade (SOF)(A) headquartered at Fort Bragg, North Carolina, is the United States military's SOF CA force. The 95th Civil Affairs Brigade consists of five battalions, shown in Table 2, each of which is assigned to a specific

¹⁸¹ “Three Top Economists Agree 2009 Worst Financial Crisis Since Great Depression; Risks Increase If Right Steps Are Not Taken,” February 13, 2009, <https://www.businesswire.com/news/home/20090213005161/en/Top-Economists-Agree-2009-Worst-Financial-Crisis>; Marella et al., “Bitcoin: A Social Movement under Attack,” 147.

¹⁸² Marella et al., “Bitcoin: A Social Movement under Attack,” 147.

¹⁸³ Marella et al., 151.

geographic combatant command, under which they report directly to the Theater Special Operations Command (TSOC).

Table 2. 95th Civil Affairs Brigade Task Organization IRT
Geographic Combatant Commands

95th Civil Affairs Brigade (subordinate battalions)	Theater Special Operations Command	Geographic Combatant Command
91 st Civil Affairs Battalion	United States Special Operations Command Africa (SOCAF)	United States Africa Command (AFRICOM)
92 nd Civil Affairs Battalion	United States Special Operations Command Europe (SOCEUR)	United States Europe Command (EUCOM)
96 th Civil Affairs Battalion	United States Special Operations Command Central (SOCCENT)	United States Central Command (CENTCOM)
97 th Civil Affairs Battalion	United States Special Operations Command Indo-Pacific (SOCINDOPAC)	United States Indo-Pacific Command (INDOPACOM)
98 th Civil Affairs Battalion	United States Special Operations Command Southern (SOCSOUTH)	United States Southern Command (SOUTHCOM)

Each battalion has six civil affairs line companies, with five civil affairs teams (CATs) per line company. Each company deploys teams to their respective geographic combatant command region, usually consisting of anywhere from one to six countries, as teams can conduct split ops with one to two team members operating in a low threat semi-permissive environment. A civil affairs team consists of four soldiers—led by a commissioned officer, the team leader (TL), and three non-commissioned officers (NCO), a team sergeant (TS), team civil affairs NCO (CANCO) and a team medic (TM).

Civil Affairs is deployed global operationally in all theaters across the range of military operations, conducting civil affairs operations (CAO) as outlined in Department of Defense Directives 5100.01 and 2000.13, as well as USSOCOM Directive 525-38. USSOCOM 525-38 outlines specific activities SOF CA can conduct within the Civil-

Military Engagement program.¹⁸⁴ USSOCOM Directive 525-38 provides further guidance as to what authorities SOF CA are legally bound to operate under. Title 10 and Title 22 of the United States Code being the most common of which SOF CA operate under, and Title 32 being for when Defense Support of Civil Authorities within the United States is required.¹⁸⁵

When deployed, the CA teams can be assigned various lines of funding, most common are operational funds (OPFUND) and commanders emergency response program (CERP) funds. OPFUND is a funding line for micro-purchases for goods or services that are mission essential and are not immediately available from United States government sources.¹⁸⁶ CERP is a program designed to give commanders the ability to “respond with urgent humanitarian relief and reconstruction requirements for the indigenous population, improving local governance capacity by partnering with provincial government agencies in identifying, prioritizing, selecting and developing projects, as well as ensuring larger, more strategic projects are connected to the local populace—all of which can aid in creating momentum and conditions for economic recovery and development.”¹⁸⁷

Prior to deployment, CA units will participate in Pre-Mission Training (PMT), which is training tailored for the company’s overall mission, down to the teams and each individual within the teams, and their countries of focus. PMT can consist of several months of compounded training that can focus on anything from close quarter combat scenarios, tactical and/or off-road driving capability, effective meeting skills/advanced negotiation techniques, network development and civil information analysis to financial

¹⁸⁴ Department of the Army, *Counterinsurgency Operations*, FM 3-24 (Washington, DC: Department of the Army, 2004), 1-1, 1-2, 4-18.

¹⁸⁵ Department of the Army, *Civil Affairs Operations*, FM 3-57 (Headquarters, Department of the Army, April 2019), 1-2,2-8, 2-9, 2-23, 2-24, 4-7,4-10, 4-11.

¹⁸⁶ Department of the Army, *Field Ordering Officer (FOO) and Pay Agent (PA) Operations*, ATP 1-06.1 (Washington, DC: Department of the Army, 2013), 2-2, 2-3.

¹⁸⁷ Department of the Army, *The Commanders’ Emergency Response Program*, ATP 1-06.2 (Washington, DC: Department of the Army, 2017), v.

training such as Field Ordering Officer (FOO) and Pay Agent (PA) training, that covers various funding lines that CATs will have access to while deployed.

Typically, PMT will culminate with a Mission Readiness Exercise (MRX) in which the entire company will participate to assist in identifying any last moment weaknesses within the CATs or CMOC themselves. The MRX allows the commander to adjust his/her CATs or CMOC as needed to balance personnel skillsets and strengths to aid in overall mission success while deployed. The MRX combines mock hostile, semi-permissive and permissive environment—enabling CATs and the Civil Military Operations Center (CMOC) to put their developed and refined skills from PMT into realistic scenarios that they may encounter once deployed. Scenarios can include but are not limited to enemy ambushes while moving to an objective, key leader engagements (KLEs) that go awry, developing networks and properly identifying which individuals or groups are vital to overall stability and success to the particular area and what their interests are. MRX's typically take up to a week to complete, depending on how well they are planned out and resourced, and how well the CATs and CMOC do throughout the duration of the MRX.

A. PRE-MISSION TRAINING

It is the third week of the PMT cycle and CAT 112 (CAT 2, Alpha Company, 91st CA Battalion) is preparing for their upcoming financial training over the next two days. The first day will consist of FOO and PA training, in which the TL and CANCO will attend. The TL and CANCO will learn the basics of how to draw their OPFUND, how to accurately fill out standard form 44 (SF44), reconcile and close out their OPFUND account. Most importantly that day, they will learn what they can procure and what they cannot procure with OPFUND. Procuring the wrong item(s) can lead to severe penalties.

Day two, the entire team will attend CERP training and familiarize themselves with the nuances of how to adequately apply CERP while deployed. During the CERP training, the training staff from the 323rd Finance Company advise the team that there has been a recent update in DOD and Army regulations that allow CERP to be converted to Bitcoin and spent as such—if the vendor requests payment as such. The team does not

think much about the Bitcoin option just yet, as they have all read articles about the volatility and how a lot of the articles speak to the illicit use of Bitcoin on the dark web.

The third and final day of the financial training is testing and practical exercise day—where the team will take the standard written test, and if they passed, they will then move on to a scenario in which they have to use both OPFUND and CERP appropriately. In this scenario, CAT 112 arrives in the fictitious country of Aynek and shortly after arriving, they discover they lack inadequate and missing tow and recovery package for their two Toyota Hilux SUVs. The TL decides this is a valid case to utilize OPFUND and as the acting FOO, tells his CANCO, the acting PA to start the process.

The next part of the day three scenario is set up where CAT 112 completes a successful KLE and through their post KLE analysis, they derive that if they were to conduct a small-scale project which outfitted the local school with more modern equipment comparable to other schools in the nearby larger villages, they could make a significant impact and gain favor with the local village chief and elders. The TL decides that CERP would be a viable option in this case, and spends the \$2,000 required on the new school equipment. As the team graduates the three-day financial training course, the trainers from the 323rd reiterate to CAT 112 not to forget about the Bitcoin option, as their analysis has shown it is a growing option in countries with weakened financial infrastructure.

Fast forward to week 12 of the PMT cycle, and alpha company of the 91st CA Battalion is preparing to conduct their MRX in a rural county in Mississippi, in which the battalion staff and alpha company leadership have provided scripts to key individuals within the county utilities and governance positions. The superintendent of the county water department has been advised that her village is lacking adequate water resources for drinking and hygiene and if the teams can come up with a reasonable project that might solve this issue—she is to demand payment in Bitcoin over USD or local fiat currency.

By the third day, CAT 112 is in their makeshift team room, going over their reports from their recent KLEs. CAT 112's TM mentions that during their civil

reconnaissance of a nearby village on the first day, the elders were complaining of inadequate drinking water and they confirmed that with their recent KLE at the county water department with the superintendent, she had alluded to the same issue. The TM mentions they could potentially procure a water purification system that could purify enough water on a daily basis for the village to live off of and it could be sustainable given the village power source and low maintenance requirements of the system. The TL and TS both agree that it is an excellent idea and that the team will contact the county water department first thing in the morning to discuss the option.

After a good night's rest, CAT 112 coordinates a meeting with the superintendent of the county water department to discuss their project proposal. During the discussion, the superintendent asks about the payment of such project – in which the TS responds with that the project can be paid for in either USD or local fiat currency, depending on their preference. The superintendent states that due to the current political situation and weakened economic state of the country—nearly no one in the region does business in any fiat currency any more. Stunned by her comments, the TL and TS begin to ponder how they can overcome this obstacle, only to be reminded by the CANCO that they can use the CERP via Bitcoin. The superintendent perks up at the near mention of Bitcoin and says loudly, yes, yes! Bitcoin is gladly accepted around here. The TL, TS and superintendent discuss in more detail about the project and about a local vendor who is able to supply the water purification system. The superintendent contacts the vendor and has him come to his office immediately to discuss pricing for delivery and installation of the water purification system. Once CAT 112 and the vendor come to an agreement on price, the TL has the CANCO take out the government issued smart phone, which possesses the teams Bitcoin wallet and has the CANCO convert the appropriate amount of USD to Bitcoin for payment to the vendor who will install the water purification system in the local village.

After hearing about the result of this scenario, the Alpha company commander and first sergeant are impressed with CAT 112's results. After the MRX is completed, the commander and first sergeant discuss which countries the teams should deploy to, based off their strengths and weaknesses. Knowing that Somalia has a growing trend of

cryptocurrency usage, particularly Bitcoin, the command team designates CAT 112 to go conduct CAO in Somalia. The command team informs CAT 112 of their decision and CAT 112 quickly begins to research Somalia, in which they discover through the U.S. State Department's Somalia country page, that the United States objectives are to "promote political and economic stability, prevent the use of Somalia as a safe haven for international terrorism, and alleviate the humanitarian crisis caused by years of conflict, drought, flooding, and poor governance."¹⁸⁸ The TL and TS also make note of USAFRICOM's and SOCAF's objectives for Somalia and share the information with the CANCO and TM. CAT 112 has to ensure they are meeting United States objectives, all the while ensuring they are executing USAFRICOM's and SOCAF's objectives as well.

B. DEPLOYMENT

Upon arrival to Somalia, CAT 112 completes a "left-seat, right-seat" turn over with the departing team, who over a period of three days, quickly orients CAT 112 to the key regions and towns of Somalia. During this transition period, the departing team mentions that in the region of Galguduud, there is a town called Guriceel which they were unable to access during their six-month rotation, but they have reports of Al-Shabab using the area as a safe haven as they transition through the region. CAT 112 take note of this and begin coordinating through the Embassy's Regional Security Office for approval to travel to Guriceel. The Regional Security Officer provides an updated threat brief to CAT 112 about the Galguduud region and the town of Guriceel and grants them approval to travel in order to allow CAT 112 to conduct civil reconnaissance and to gather information that may lead to potential project opportunities in vicinity of Guriceel that would lead to efforts to deny Al-Shabab safe haven in the region.

With approval from the embassy, the team sends up their concept of operations (CONOP) to the TSOC for approval through the SOF channels. Within 48 hours, CAT 112 has approval from the TSOC and is cleared to conduct civil reconnaissance in Guriceel and surrounding areas. At the end of their first week in country, CAT 112

¹⁸⁸ "U.S. Relations With Somalia," United States Department of State, August 13, 2018, <https://www.state.gov/u-s-relations-with-somalia/>.

begins coordination with their host nation military partners for security escort and to conduct joint operations with Somalia's version of civil affairs.

On their ninth day in country, CAT 112 and host nation military partners are traveling to Guriceel to meet with local elders and the town mayor and his staff. Upon arrival, CAT 112 is amazed by the hospitality of the locals and the warm welcome they receive when entering the town. After spending two days of talking to local elders, business owners, the team finally is able to arrange a meeting with the mayor of Guriceel to discuss local issues and how the Somali government can better assist the town. The mayor hints at CAT 112 that they should visit the local goat farms, as there has been a spike in inedible goat meat and a decline in drinkable goat milk.

The team heads out to several goat farms the following day to talk to the farmers about the issues that the mayor mentioned. As the farmers confirm the issues, the TM mentions the idea of reaching back to the battalion veterinarian and the potential to conduct a veterinarian readiness and training exercise (VETRETE) with local veterinarians and reaching out to any local non-governmental organizations (NGOs) that might be assisting with projects within the livestock field. The TS immediately begins coordinating with the TSOC and battalion to have the battalion veterinarian come out for a week to assist with the VETRETE.

Whilst researching veterinary organizations within the region, the TL stumbles upon a local non-profit organization called Somali Veterinary Medical Association (SVMA). SVMA happens to do "projects focused on strategic controlling of Zoonotic diseases" in the other regions, but have yet to come to Galguduud due to the threat of violence brought on by the presence of Al-Shabab members.¹⁸⁹ The TL reaches out to the SVMA leadership and explains the situation in Guriceel regarding the goats and the inedible meat and lack of drinkable goat milk. The SVMA leadership claims they are more than willing to help in the region, however security is a concern. The TL explains that he will coordinate with the Somalia military to provide adequate escort security for SVMA personnel and to provide a security cordon during the VETRETE. As the SVMA

¹⁸⁹ "Projects – SVMA," accessed November 8, 2019, <https://www.somalivet.org/index.php/projects/>.

leadership agrees under the promise of adequate security, the SVMA leadership explains to the TL that they pay for the veterinarian medicine and supplies out of pocket and that they also would require additional funding to ensure they have sufficient veterinarian medicine and supplies on hand.

The SVMA leadership also stated they would coordinate for another NGO, Ari.Farm to accompany them. Ari.Farm is a start-up that helps with the trading of livestock year-round – which can be difficult in Somalia given the “water scarcity and recurring droughts”.¹⁹⁰ Ari.Farm also has gained notoriety through their willingness to accept Bitcoin, especially in Somalia, in large part due to the overwhelmingly majority of Somalia’s currency, the shilling, being counterfeit and the fragile economic situation.¹⁹¹ After hearing all of the aforementioned, the TL states that the team can assist the SVMA by paying for a portion of the veterinarian medicine and supplies, as well as paying Ari.Farm for their assistance to bring in healthy livestock and set up a viable means to maintain healthy goats and for their coordination to ensure year round trading.

The TL meets with the mayor of Guriceel to update him on his meetings with SVMA and Ari.Farm and the VETRETE proposal. The mayor approves and is excited for the VETRETE, and states that previously they had NGOs come in to attempt to do similar projects, but Al-Shabab would either kill them or run them off and steal their supplies and any livestock they might have brought with them. The mayor also stated that by paying the NGOs with Bitcoin, that they would help mitigate the potential for corruption, as CAT 112 could pay the SVMA and Ari.Farm personnel individually vs. paying one of the leaders the entire sum and counting on them to dole out the money appropriately without skimming off of the top.

Three weeks later: CAT 112 returns to Guriceel with the battalion veterinarian and host nation military partners and meets members of SVMA and Ari.Farm in preparation for the VETRETE. The VETRETE begins and the local goat farmers bring in

¹⁹⁰ Abdi Latif Dahir, “Crowdfarming Is Being Used to Bring Somalia’s Livestock Market into the Digital Economy,” Quartz Africa, December 6, 2017, <https://qz.com/africa/1148263/a-startup-is-using-bitcoin-to-sell-somali-goats-and-sheep-with-a-crowdfarming-app-ari-farm/>.

¹⁹¹ Dahir, “Crowdfarming.”

their herds of goats by the thousands to be examined and treated by the various veterinarians and their assistants. Over a three-day period, the event turns out to be a resounding success.

Upon the completion of the third day, CAT 112's TL tells the CANCO to pull out the team smartphone and begin converting the appropriate amount of USD to Bitcoin. The CANCO uses an app that allows for instant conversion of the teams CERP funds stored on the app's account to be converted to Bitcoin for a minor fee. Within seconds, the conversion is complete and the CANCO can begin to pay SVMA for the veterinarian medicine and supplies they provided and Ari.Farm for the livestock they brought and for their future services to guarantee year-round livestock trading for the local goat farmers. The SVMA and Ari.Farm staff pull out their smart phones and open up their Bitcoin wallets, displaying a QR code, which the CANCO scans, and send the appropriate amount of Bitcoin to each individual.

Following completion of the VETRETE, the TL produces the storyboard showing the success of the VETRETE with three of the four photos displaying the various veterinarians in various examinations of the livestock, and the fourth photo being of the CANCO paying the SVMA and Ari.Farm staff with Bitcoin via smartphone to smartphone transactions. CAT 112 was able to avoid the risk of converting to the local currency, which is majority counterfeited, as well as avoiding carrying a large sum of USD on them.

This thought experiment highlights a realistic mission scenario conducted by SOF in countries around the world. Civil Affairs was highlighted due to the authors real world experiences and CA's deployments, in which it is not out of the ordinary for the team to travel with large sums of cash for small scale projects. As some fiat currencies in developing countries are experiencing severe devaluation, the popularity of cryptocurrencies like Bitcoin are growing—despite the volatility of cryptocurrencies.¹⁹² This experiment focuses on the potential use of cryptocurrencies during missions around

¹⁹² Aaron Hankin, "This Is Where Cryptocurrencies Are Actually Making a Difference in the World," MarketWatch, <https://www.marketwatch.com/story/this-is-where-cryptocurrencies-are-actually-making-a-difference-in-the-world-2018-10-03>.

the world and underscores the importance for SOCOM to understand the emerging cryptocurrency technology as well as the social movement conditions and participants that are impacting innovation and wider acceptance.

THIS PAGE INTENTIONALLY LEFT BLANK

V. CONCLUSION AND RECOMMENDATION

The future of cryptocurrency remains uncertain as the technology and regulation of the industry continue to evolve.¹⁹³ To determine if there is a plausible future global financial order that includes cryptocurrency, this thesis examines the evolution of Bitcoin and its blockchain technology through a social movement theory lens to provide a fuller understanding of the social change sought through the creation of the cryptocurrency. This broader comprehension of Bitcoin, as a social movement, allows the thesis to analyze the technology as well as the various actors exerting influence on the movement both independently and collectively. Within this analysis, the importance of the three critical conditions, political opportunities, mobilizing structures, and framing processes, are discussed to explain why it is fallacious to characterize Bitcoin, and other cryptocurrencies, as merely disruptive technology. Viewing Bitcoin through a wider lens would also allow SOCOM and the U.S. to envision ways to utilize the technology in future operations as well as lead the development and shape how the adoption of cryptocurrency into the global financial order occurs.

First, this thesis traces the lineage of ideas to use cryptography to protect privacy and to create a digital currency to establish that Bitcoin is not a new phenomenon, but the result of past social movement failures. Privacy concerns continue to exist with the growth and integration of computer technology into everyday life and also remains a crucial debate around cryptocurrency. Attempts to spark a digital currency movement failed to gain enough acceptance, but the ideas and research, created by these initial movements, informed future efforts. Social movement theory aids in understanding that not every grievance develops into a social movement (or revolution). Thus, the examination of conditions in the environment, which existed during the initial digital currency social movement attempts, reveal that the political opportunities, mobilizing structures, and framing processes were not sufficient to create and sustain a social movement.

¹⁹³ McBride and Gold, “Cryptocurrency,” 55.

In Chapter II, the thesis analysis shifts to Bitcoin and the conditions in the environment, which led to the creation of cryptocurrency and its blockchain technology. There is almost universal agreement that without the 2007–2008 U.S. financial crisis, which led to global economic instability, Bitcoin and blockchain technology likely fail to gain initial acceptance like predecessor digital currency ideas. Sean Everton’s Social Movement Theory model assists in examining the underlying opportunities and mobilization structures, which existed within the environment, to support the formation of the Bitcoin social movement. The U.S. financial crisis created political and economic instability. However, the presence of ideological openness towards an alternative to state-issued fiat currency and shifting alignment among some elites also played a pivotal role in the formation of the movement. Unlike social movements that relied on the mobilization of resources for physical protests for Civil Rights, Women’s Rights, and Worker Rights, the mobilization for the Bitcoin occurs primarily through online means allowing the movement to be decentralized. The cultural framing process played a central role in uniting the available opportunities in the environment and the mobilization of resources.

Social movements must endure and evolve for the social change sought to occur. The evolution of the Bitcoin social movement has occurred internally and externally. Internally, the Bitcoin Foundation formed in 2012 in response to the negative framing of Bitcoin due to the use of the cryptocurrency in illicit activities. The Bitcoin Foundation does not control Bitcoin but serves as a formal social movement organization that advocates to state lawmakers on behalf of Bitcoin and other cryptocurrencies. In total, there 15 non-profit Bitcoin organizations, which are located in various countries and the U.S. (see Figure 4 in Chapter II, Section B), highlighting the growth and evolution of the movement. The lack of direct control over the Bitcoin movement, however, allows the informal organization of the movement to continue. The evolution of the Bitcoin movement includes investors in the Bitcoin cryptocurrency. Investors’ interests are profit-driven, but also add credibility to the argument that Bitcoin is a form of stored value or money.

Technology is the foundation of the Bitcoin social movement. Chapter II concludes with an analysis of the innovations occurring within the social movement, which are akin to the spillover effects studied by Meyer and Whittier. The rapid creation of alternative cryptocurrencies as well as alternative uses of the blockchain technology is both indicative of social movement spillover, which is characterized by the flow of “ideas, tactics, style, participants, and organizations from one movement to another movement.”¹⁹⁴ Bitcoin and its blockchain are the basis for every alternative cryptocurrency and blockchain developed since its launch in 2009.

The Libra cryptocurrency proposal, highlighted in the analysis, represents a unique evolution in alternative cryptocurrency. The Facebook-led cryptocurrency project proposes to establish an independent governing body, the Libra Association, which functions like a centralized bank or state-run organization but is comprised of multinational corporations. The Facebook cryptocurrency model is receiving scrutiny from the U.S. and European governments, which may delay or prevent its launch. The release of the Libra proposal, however, serves as a model that adversarial states such as China and Russia can explore as the countries attempt to lessen U.S. influence over the global financial order.

In Chapter III, the thesis examines the role that sovereign nations, adversarial states, and non-state actors are undertaking to counter as well as leverage elements of the Bitcoin social movement. The U.S. and several other allied states are primarily focused on the legislation and prevention of cryptocurrency use in money laundering, terrorist funding, and other nefarious activities. U.S. lawmakers appear focused on maintaining the status quo of the current financial system, which affords the leverage to use sanctions to influence diplomatic outcomes. Adversarial states are investing in blockchain and cryptocurrency as a means to establish a cryptocurrency or state digital currency alternative to the U.S. SWIFT based system. Like the U.S., adversarial states like China and Russia restrict the use of Bitcoin and other cryptocurrencies. However, China and Russia, as well as Iran, are also investing in research to develop innovations in

¹⁹⁴ Meyer and Whittier, “Social Movement Spillover,” 277–78.

cryptocurrency technology, which may lead to wider regional acceptance and lessen the strength of U.S. sanction authority.

Non-state actors, however, are less likely to generate innovations in cryptocurrency and blockchain technology. McBride and Gold document in their August 2019 research memo that criminal and terrorist organizations are primarily using cryptocurrency as another means to transfer funds or purchase illegal and legal goods.¹⁹⁵ Like investors, criminals and terrorists are closer to free-riders, looking to exploit the Bitcoin social movement for their benefit, rather than innovators seeking to further the enhancement of the technology that underpins the Bitcoin social movement.

Finally, in Chapter IV, the thesis explores the future usage of cryptocurrency by Special Operations Forces. Specifically, the thought experiment focuses on civil affairs, which is one component of the SOF enterprise and is often deployed to developing nations states that are of strategic importance to the United States. Numerous countries where SOF deploys to are exploring the use of cryptocurrency and other forms of mobile payments in place of state-issued fiat currency, which in some countries is being devalued. It is not unrealistic, that in the near future, deployed SOF units will need access to cryptocurrency to fund a project, obtain time-sensitive information, or purchase supplies.

Bitcoin has endured and evolved over the past decade, while scholars have debated its validity as a legitimate form of stored value, which has led to the prediction of a cryptocurrency industry crash. The primary argument of this thesis is that Bitcoin is a social movement requiring analysis through a social movement lens to better understanding the conditions in the environment, which continue to sustain the movement. Social movements are complex and are not uniform from one movement to the next movement. The Bitcoin social movement is intertwined with technology to create social change in the financial system challenging existing state and traditional banking intermediary systems, creating a unique social movement compared to other historical movements that relied heavily on physical protests. This broader perspective of

¹⁹⁵ McBride and Gold, “Cryptocurrency,” 21–23.

Bitcoin (and the cryptocurrency industry) calls for the U.S. and DOD to look beyond defensive measures aimed at preventing the use of cryptocurrency in illegal activities, but ways to exploit the technology in support of U.S. objectives as well as leading how cryptocurrency is incorporated into the global financial system.

Education and training to understand cryptocurrency to enable the exploitation of the technology-based movement is critical. The scenario presented in Chapter IV, which focuses on the potential use of cryptocurrency by SOF to gain access and influence, moves past prevention to the operationalization of cryptocurrency.¹⁹⁶ In addition to using in missions, McBride and Gold's research identifies opportunities for SOF to "collaborate with (or lead) new partners and to shape the future environment," which this thesis agrees are in the best interest of the U.S. and DOD. SOF is often used to test new equipment and technologies before implementation into the conventional force. SOF also maintains and is tasked with coordination, which makes it adept at building relationships with civilian industry experts and government leaders to translate how emerging technologies pose both opportunities as well as threats. In examining Bitcoin, as a social movement, the threat potential of cryptocurrency has overshadowed the potential to operationalize the technology to support U.S. policy objectives. Focusing primarily on the threat potential of cryptocurrency is akin to trying to stop or suppress an uprising or social movement without addressing the underlying grievance(s). However, operationalizing the technology, in support of U.S. policy objective, signals that innovation or change to the global financial system is feasible under U.S. leadership.

¹⁹⁶ McBride and Gold, "Cryptocurrency," 50–55.

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

- Aggarwal, Gourang, Vimal Patel, Gaurav Varshney, and Kimberly Oostman. "Understanding the Social Factors Affecting the Cryptocurrency Market." *ArXiv:1901.06245 [Cs]*, January 13, 2019. <http://arxiv.org/abs/1901.06245>.
- Aldaz-Carroll, Enrique, and Eduardo Aldaz-Carroll. "Can Cryptocurrencies and Blockchain Help Fight Corruption?" Brookings, February 1, 2018. <https://www.brookings.edu/blog/future-development/2018/02/01/can-cryptocurrencies-and-blockchain-help-fight-corruption/>.
- Barkhatov, Viktor, Ekaterina Lyman, and Ivan Koptelov. "The Interrelation and Interaction of Financial Markets with Financial Cycles of the National Economy of Russia." *CBU International Conference Proceedings* 7 (September 30, 2019). <https://doi.org/10.12955/cbup.v7.1336>.
- Benford, Robert D., and David A. Snow. "Framing Processes and Social Movements: An Overview and Assessment." *Annual Review of Sociology; Palo Alto* 26 (2000): 611–39.
- Bitcoin.org. "Bitcoin Communities." Accessed September 28, 2019. <https://bitcoin.org/en/community>.
- Böhme, Rainer, Nicolas Christin, Benjamin Edelman, and Tyler Moore. "Bitcoin: Economics, Technology, and Governance." *Journal of Economic Perspectives* 29, no. 2 (May 2015): 213–38. <https://doi.org/10.1257/jep.29.2.213>.
- Buchanan, William J. *Cryptography*. Denmark: River Publishers, 2017.
- Buterin, Vitalik. "A Next-Generation Smart Contract and Decentralized Application Platform." GitHub, November 2013. <https://github.com/ethereum/wiki/wiki/White-Paper#ethereum>.
- Calhoun, Craig. "Occupy Wall Street in Perspective." *British Journal of Sociology* 64, no. 1 (2013): 26–38.
- Chaum, David. "Blind Signatures for Untraceable Payments." In *Advances in Cryptology*, edited by David Chaum, Ronald L. Rivest, and Alan T. Sherman, 199–203. New York: Springer, 1983.
- Cheng, Evelyn. "Bitcoin Bond Launch Brings Digital Currency Step Closer to 'World of High Finance.'" CNBC, August 17, 2017. <https://www.cnbc.com/2017/08/17/bitcoin-bond-launch-brings-digital-currency-step-closer-to-high-finance.html>.

- Chigbo, Ken. "Russian Arms Producer to Use Bitcoin to Bypass Sanctions." FXStreet, July 29, 2019. <https://www.fxstreet.com/cryptocurrencies/news/russian-arms-producer-to-use-bitcoin-to-bypass-sanctions-201907291503>.
- Chohan, Usman W. "Cryptocurrencies as Asset-Backed Instruments: The Venezuelan Petro." Discussion Paper Series: Notes on the 21 St Century. University of New South Wales, Canberra, February 7, 2018.
- Ciaian, Pavel, Miroslava Rajcaniova, and d'Artis Kancs. "The Economics of BitCoin Price Formation." *Applied Economics* 48, no. 19 (April 20, 2016): 1799–1815. <https://doi.org/10.1080/00036846.2015.1109038>.
- CoinMarketCap. "All Cryptocurrencies." CoinMarketCap. Accessed January 14, 2019. <https://coinmarketcap.com/all/views/all/>.
- CoinMarketCap. "Bitcoin (BTC) Price, Charts, Market Cap, and Other Metrics." Accessed January 14, 2019. <https://coinmarketcap.com/currencies/bitcoin/>.
- Cox, Jeff. "Federal Reserve Starting to Think about Its Own Digital Currency, Dudley Says." CNBC, November 29, 2017. <https://www.cnbc.com/2017/11/29/federal-reserve-starting-to-think-about-its-own-digital-currency-dudley-says.html>.
- Cuthbertson, Anthony. "China Bans Anti-Blockchain Sentiment and Prepares to Launch Its Own Cryptocurrency." *The Independent*, October 30, 2019, <https://www.independent.co.uk/life-style/gadgets-and-tech/news/china-cryptocurrency-blockchain-bitcoin-a9176636.html>
- Dahir, Abdi Latif. "Crowdfarming Is Being Used to Bring Somalia's Livestock Market into the Digital Economy." Quartz Africa, December 6, 2017. <https://qz.com/africa/1148263/a-startup-is-using-bitcoin-to-sell-somali-goats-and-sheep-with-a-crowdfarming-app-ari-farm/>.
- Daily Outlook Afghanistan. "Afghanistan Considers Issuing Bitcoin Bond." Daily Outlook Afghanistan, April 21, 2019. http://outlookafghanistan.net/national_detail.php?post_id=23449.
- Department of the Army. *Field Ordering Officer (FOO) and Pay Agent (PA) Operations*. ATP 1-06.1. Washington, DC: Department of the Army, 2013.
- . *Civil Affairs Operations*, FM 3-57. Washington, DC: Department of the Army, April 2019.
- . *Counterinsurgency Operations*, FM 3-24. Washington, DC: Department of the Army, 2004.
- . *The Commanders' Emergency Response Program*. ATP 1-06.2. Washington, DC: Department of the Army, 2017.

- Dion-Schwarz, Cynthia. *Terrorist Use of Cryptocurrencies: Technical and Organizational Barriers and Future Threats*. Santa Monica, CA: RAND, 2019.
- Dodd, Nigel. "The Social Life of Bitcoin." *Theory, Culture & Society* 35, no. 3 (May 1, 2018): 35–56. <https://doi.org/10.1177/0263276417746464>.
- Dudley, Sara, Travis Pond, Ryan Roseberry, and Shawn Carden. "Evasive Maneuvers: How Malign Actors Leverage Cryptocurrency." National Defense University Press, January 2019. <http://ndupress.ndu.edu/Media/News/News-Article-View/Article/1738242/evasive-maneuvers-how-malign-actors-leverage-cryptocurrency/>.
- Edwards, Gemma. *Social Movements and Protest*. Key Topics in Sociology. Cambridge: Cambridge Univ. Press, 2014.
- Emem, Mark. "Iran Launches Gold-Backed Cryptocurrency as Anticipation for Crypto-Rial Grows to Evade U.S. Sanctions." CCN.com, January 31, 2019. <https://www.ccn.com/iran-launches-gold-backed-cryptocurrency-as-anticipation-for-crypto-rial-grows-to-evade-us-sanctions/>.
- Fanusie, Yaya. " Hamas Military Wing Crowdfunding Bitcoin." *Forbes*, February 4, 2019. <https://www.forbes.com/sites/yayafanusie/2019/02/04/hamas-military-wing-crowdfunding-bitcoin/>.
- , and Trevor Logan. "Crypto Rogues." FDD, July 11, 2019. <https://www.fdd.org/analysis/2019/07/11/crypto-rogues/>.
- Gamson, William A., and David S. Meyer. "Framing Political Opportunity." In *Comparative Perspectives on Social Movements: Political Opportunities, Mobilizing Structures, and Cultural Framings*, edited by Doug McAdam, John D. McCarthy, and Mayer Zald, 275–90. Cambridge Studies in Comparative Politics. Cambridge: Cambridge University Press, 1996.
- Glaser, April. "Why Mark Zuckerberg Keeps Saying Facebook Needs to Win Against China." *Slate Magazine*, October 23, 2019. <https://slate.com/technology/2019/10/mark-zuckerberg-facebook-libra-cryptocurrency-china-free-speech.html>.
- Global Ethical Banking. "Argentina And Paraguay Settle Exports Deal Using Bitcoin." Global Ethical Banking, February 19, 2019. <http://www.globalethicalbanking.com/argentina-paraguay-settle-exports-deal-using-bitcoin/>.
- Goffman, Erving. *Frame Analysis: An Essay on the Organization of Experience* /. Cambridge, MA: Harvard University Press, 1974.

- Gregg, Heather Selma. "Three Theories of Religious Activism and Violence: Social Movements, Fundamentalists, and Apocalyptic Warriors." *Terrorism and Political Violence* 28, no. 2 (March 14, 2016): 338–60. <https://doi.org/10.1080/09546553.2014.918879>.
- Hankin, Aaron. "This Is Where Cryptocurrencies Are Actually Making a Difference in the World." MarketWatch, October 29, 2018. <https://www.marketwatch.com/story/this-is-where-cryptocurrencies-are-actually-making-a-difference-in-the-world-2018-10-03>.
- Huang, Roger. "China's Digital Currency Is Unlikely To Be A Cryptocurrency." *Forbes*, August 14, 2019. <https://www.forbes.com/sites/rogerhuang/2019/08/14/chinas-digital-currency-is-unlikely-to-be-a-cryptocurrency/>.
- Hudson, Saul. "Venezuelans Reach for Bitcoin as Lifeline to Weather the Nation's Economic Crisis." *Newsweek*, April 22, 2019. <https://www.newsweek.com/venezuela-economic-crisis-perfect-storm-bitcoin-lifeline-opinion-1402684>.
- Isaac, Mike, and Nathaniel Popper. "Facebook Plans Global Financial System Based on Cryptocurrency." *New York Times*, June 18, 2019. <https://www.nytimes.com/2019/06/18/technology/facebook-cryptocurrency-libra.html>.
- Jonge, Max De, and Daan De Jonge. "A Brief Overview on China and Cryptocurrency." *Ningbo Economic Review*, Insights Essay, no. 1 (April 2018).
- Katz, Rita. "The Bitcoin Jihad in Syria and Beyond: Tales of Crypto-Currency." October 13, 2019. <https://www.thedailybeast.com/the-bitcoin-jihad-in-syria-and-beyond-theses-of-crypto-currency>.
- Koester, Wolfgang. "Fed-Backed Digital Currency Is Inevitable." *American Banker*, January 10, 2018. <https://www.americanbanker.com/opinion/fed-backed-digital-currency-is-inevitable>.
- Konowicz, Deane R. "The New Game: Cryptocurrency Challenges U.S. Economic Sanctions." Newport, RI: U.S. Naval War College, February 18, 2018.
- Kudlovich, Yuriy. "How Cryptocurrency Mixers and Anonymous Wallets Work." January 17, 2018. <https://decenter.org/en/how-cryptocurrency-mixers-and-anonymous-wallets-work>.
- Lee, Seunghyeon, Changhoon Yoon, Heedo Kang, Yeonkeun Kim, Yongdae Kim, Dongsu Han, Sooel Son, and Seungwon Shin. "Cybercriminal Minds: An Investigative Study of Cryptocurrency Abuses in the Dark Web." In *Proceedings 2019 Network and Distributed System Security Symposium*. San Diego, CA: Internet Society, 2019. <https://doi.org/10.14722/ndss.2019.23055>.

- Libra Association Members. "An Introduction to the Libra." White Paper, July 23, 2019. <https://libra.org/en-US/white-paper/>.
- Marella, Venkata, Juho Lindman, Matti Rossi, and Virpi Tuunainen. "Bitcoin: A Social Movement under Attack." *Selected Paper of the IRS*, no. 8 (2017), 147–73.
- Marr, Bernard. "A Complete Beginner's Guide To Blockchain." *Forbes*, January 24, 2017. <https://www.forbes.com/sites/bernardmarr/2017/01/24/a-complete-beginners-guide-to-blockchain/>.
- McAdam, Doug, John D. McCarthy, and Mayer Zald, eds. *Comparative Perspectives on Social Movements: Political Opportunities, Mobilizing Structures, and Cultural Framings*. Cambridge Studies in Comparative Politics. Cambridge; Cambridge University Press, 1996.
- McBride, Megan, and Zack Gold. *Cryptocurrency: Implications for Special Operations Forces*. Arlington, VA: CNA Analysis & Solutions, August 2019.
- Mearian, Lucas. "Facebook Won't Launch Cryptocurrency until U.S. Regulators Approve." *Computerworld*, October 22, 2019. <https://www.computerworld.com/article/3447678/facebook-wont-launch-cryptocurrency-until-us-regulators-approve.html>.
- Meyer, David S., and Nancy Whittier. "Social Movement Spillover." *Social Problems* 41, no. 2 (1994): 277–98. <https://doi.org/10.2307/3096934>.
- Motamedi, Maziar. "Iran's Government Recognises Cryptocurrency Mining with Caveat." August 4, 2019. <https://www.aljazeera.com/ajimpact/iran-government-recognises-cryptocurrency-mining-caveat-190804193912792.html>.
- Nakamoto, Satoshi. "Bitcoin: A Peer-to-Peer Electronic Cash System." bitcoin.org, October 2008. <https://bitcoin.org/en/bitcoin-paper>.
- Nelms, Taylor C., Bill Maurer, Lana Swartz, and Scott Mainwaring. "Social Payments: Innovation, Trust, Bitcoin, and the Sharing Economy." *Theory, Culture & Society* 35, no. 3 (May 1, 2018): 13–33. <https://doi.org/10.1177/0263276417746466>.
- Olson, Mancur. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Harvard Economic Studies; v. 124. Cambridge, MA: Harvard University Press, 1965.
- Ortutay, Barbara. "Facebook Says Libra Won't Launch without U.S. Approval." *Seattle Times*, October 22, 2019. <https://www.seattletimes.com/business/facebook-says-libra-wont-launch-without-us-approval/>.

- Popper, Nathaniel. "Blockchain Will Be Theirs, Russian Spy Boasted at Conference." *New York Times*, April 29, 2018. <https://www.nytimes.com/2018/04/29/technology/blockchain-iso-russian-spies.html>.
- . "Terrorists Turn to Bitcoin for Funding, and They're Learning Fast." *New York Times*, August 18, 2019. <https://www.nytimes.com/2019/08/18/technology/terrorists-bitcoin.html>.
- Post, Kollen. "'Pyongyang Coin' and the Future of U.S. Sanctions on North Korea - Foreign Policy Research Institute." <https://www.fpri.org/>, October 8, 2019. <https://www.fpri.org/article/2019/10/pyongyang-coin-and-the-future-of-u-s-sanctions-on-north-korea/>.
- "Projects – SVMA." Accessed November 8, 2019. <https://www.somalivet.org/index.php/projects/>.
- Raj, Samani. "Global Malware Campaign Pilfers Data from Critical Infrastructure, Entertainment, Finance, Health Care, and Other Industries," April 25, 2018. <https://securingtomorrow.mcafee.com/other-blogs/mcafee-labs/global-malware-campaign-pilfers-data-from-critical-infrastructure-entertainment-finance-health-care-and-other-industries/>.
- Shin, Laura. "How Bitcoin Solved This Serial Entrepreneur's Problems." *Forbes*, August 8, 2017. <https://www.forbes.com/sites/laurashin/2017/08/08/how-bitcoin-solved-this-serial-entrepreneurs-problems/>.
- Shuster, Simon. "Exclusive: Russia Secretly Helped Venezuela Launch a Cryptocurrency to Evade U.S. Sanctions." *Time*, March 20, 2018. <https://time.com/5206835/exclusive-russia-petro-venezuela-cryptocurrency/>.
- Smith, Nicholas Ross. "Could Russia Utilize Cryptocurrencies in Its Foreign Policy Grand Strategizing?" *Russia in Global Affairs* 17, no. 2 (2019): 134–52. <https://doi.org/10.31278/1810-6374-2019-17-2-134-152>.
- Snow, David A., and Robert D. Benford. "Master Frames and Cycles of Protest." In *Frontiers in Social Movement Theory*, edited by Aldon D. Morris and Carol McClurg Mueller, 133–55. New Haven, CT: Yale University Press, 1992.
- Stalinsky, Steve. "Drive for Donations Using Bitcoin on an ISIS-Affiliated Website." February 2, 2019. <https://www.terrorism-info.org.il/en/drive-donations-using-bitcoin-isis-affiliated-website/>.
- . "Terrorists Have Been Using Bitcoin For Four Years, So What's the Surprise?" *The Hill*, March 8, 2018. <https://thehill.com/opinion/cybersecurity/377415-terrorists-have-been-using-bitcoin-for-four-years-so-whats-the-surprise>.

- Swartz, Lana. "What Was Bitcoin, What Will It Be? The Techno-Economic Imaginaries of a New Money Technology." *Cultural Studies* 32, no. 4 (July 4, 2018): 623–50. <https://doi.org/10.1080/09502386.2017.1416420>.
- Telley, Chris. "A Coin for the Tsar: The Two Disruptive Sides of Cryptocurrency." *Small Wars Journal*. <https://smallwarsjournal.com/jrnl/art/coin-tsar-two-disruptive-sides-cryptocurrency>.
- The Bitcoin Foundation. "The Bitcoin Foundation Marketing & Operations." Accessed September 15, 2019. <https://bitcoinfoundation.org/marketing>.
- Genesis Block Newspaper. "The Bitcoin Genesis Block Newspaper." January 3, 2009. <https://www.thetimes03jan2009.com/>.
- Cato Institute. "The Case for a New International Monetary System," April 30, 2018. <https://www.cato.org/cato-journal/springsummer-2018/case-new-international-monetary-system>.
- "Three Top Economists Agree 2009 Worst Financial Crisis Since Great Depression; Risks Increase If Right Steps Are Not Taken." *Business Wire*, February 13, 2009. <https://www.businesswire.com/news/home/20090213005161/en/Top-Economists-Agree-2009-Worst-Financial-Crisis>.
- United Nations Security Council. "United Nations Report on Democratic People's Republic of Korea and DPRK's Involvement in Illicit Cyberactivity." NY: United Nations, March 12, 2019. <https://undocs.org/S/2019/171>.
- Statista. "U.S. Data Breaches and Exposed Records 2018." Accessed November 5, 2019. <https://www.statista.com/statistics/273550/data-breaches-recorded-in-the-united-states-by-number-of-breaches-and-records-exposed/>.
- Statista. "U.S. Data Breaches by Industry 2018." Accessed November 5, 2019. <https://www.statista.com/statistics/273572/number-of-data-breaches-in-the-united-states-by-business/>.
- United States Department of State. "U.S. Relations With Somalia." August 13, 2018. <https://www.state.gov/u-s-relations-with-somalia/>.
- Wan, Dovey. "Cryptocurrency in China: Over the Counter, Under the Table." *CoinDesk*, August 5, 2019. <https://www.coindesk.com/cryptocurrency-in-china-over-the-counter-under-the-table>.
- White House. *National Security Strategy of the United States of America*. Washington, DC: Executive Office of the President, December 18, 2017. <https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf>.

Wilmoth, Josiah. "Cryptocurrency Is 'Here to Stay': CFTC Chairman Giancarlo." CCN, October 2, 2018. <https://www.ccn.com/cryptocurrency-is-here-to-stay-cftc-chairman-giancarlo>.

Wilson, Tom, and Dan Williams. " Hamas Shifts Tactics in Bitcoin Fundraising, Highlighting Crypto Risks: Research." Reuters, April 25, 2019. <https://www.reuters.com/article/us-crypto-currencies-hamas-idUSKCN1S20FA>.

XinhuaNet. "Xi Stresses Development, Application of Blockchain Technology." October 25, 2019. http://www.xinhuanet.com/english/2019-10/25/c_138503254.htm.

Zarate, Juan Carlos. *Treasury's War: The Unleashing of a New Era of Financial Warfare*. First Edition. NY: Public Affairs, 2013.

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
Ft. Belvoir, Virginia
2. Dudley Knox Library
Naval Postgraduate School
Monterey, California